Chemical Week

June 12, 1954

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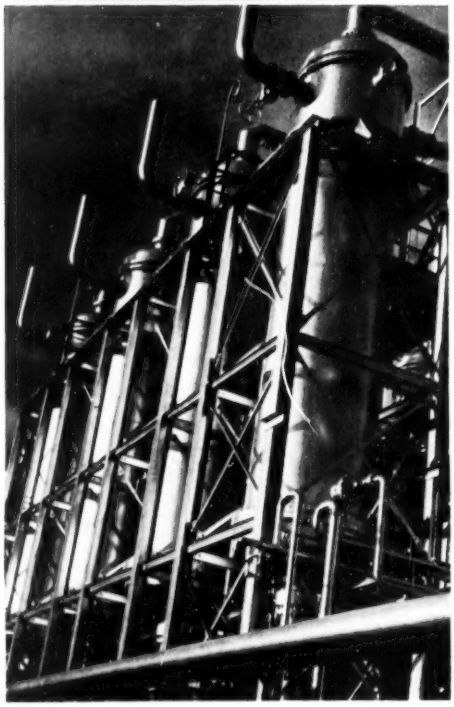

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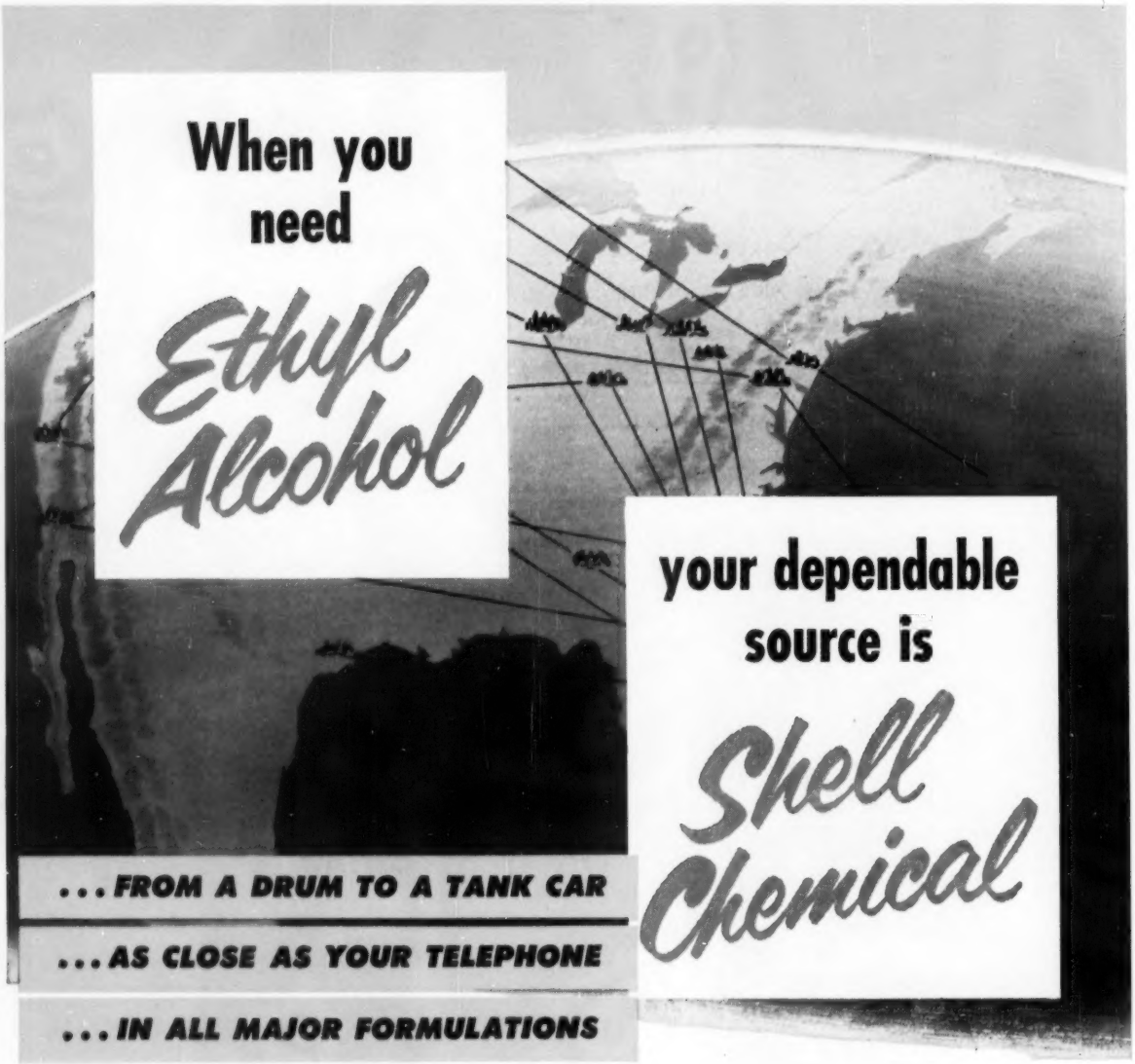

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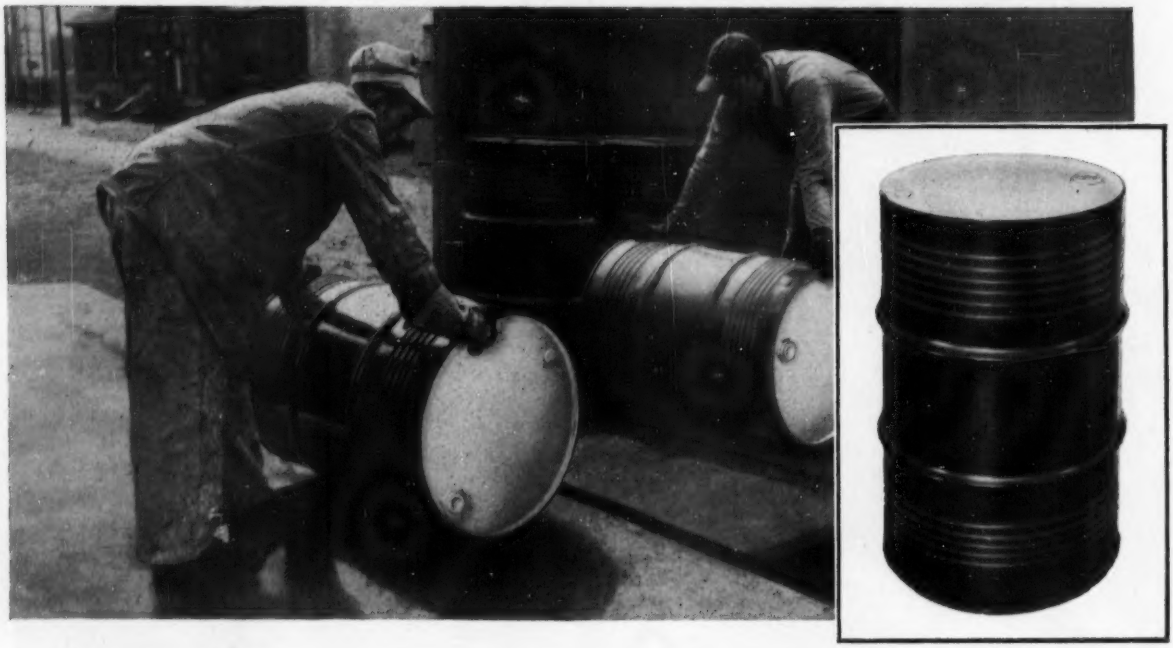

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UNITED STATES STEEL

Chemical Week

Volume 74 **June 12, 1954** Number 24

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OPINION . . . . . .

Quality the Key

TO THE EDITOR: I have read your news article "Chemicals by the Yard" *(May 15)* . . . and you have handled the subject well. The problem of analyzing the textile chemicals industry and its needs and requirements is a tremendous one . . . to take on the job of predicting those needs is courageous . . . and a task that requires ability . . .

Concerning consumer behavior, I hope that you have heard the results of the warnings and proposals at the recent symposium held under the auspices of the AATCC on May 19 . . .

RALPH G. SCHAUBHUT
Textile Chemicals Division
Nopco Chemical Co.
Harrison, N. J.

Right. The main warning issued at the symposium: quality of fabrics must be guarded if consumer sales are to be maintained. Style and fashion are no substitutes, won't help sales if quality considerations, performance characteristics of fibers and fabrics are discounted.—ED.

Dynamic and Healthy

TO THE EDITOR: In your story "Business in Boston: Static but Healthy" *(May 22)* . . . we were dismayed to find that we were not included in your listing of typical Greater Boston companies, particularly since several adhesive manufacturers were mentioned . . . We are a well-established organization, with a well-founded background of technical and sales progress . . .

It might well be that "dynamic and healthy" would be a more fitting title for your news article . . . and if you consider any future articles on our area we could cite some of our dynamic activities in a rapidly expanding and extremely active field . . .

J. F. MANNING
Research Director
Angier Products Inc.
Cambridge, Mass.

Strike: "Subsidiary"

TO THE EDITOR: When Morton Salt Co. and Ringwood Chemical Corp. . . laid the cornerstone of a new research laboratory at Woodstock, Ill., one of your reporters was evidently present at the time that Dr. Guthmann, president of Ringwood, and myself, speaking for Morton Salt, . . . stated that the facilities would be shared because of the close *association* of the two companies and for other reasons . . .

In reporting on this *(May 8)* the statement was made: "Officially revealed: the open secret that Ringwood is now a subsidiary of Morton Salt."

I am writting to request a correction of this statement as Ringwood is not now nor ever has been a subsidiary of Morton Salt . . .

DANIEL PETERKIN, JR.
President
Morton Salt Co.
Chicago

Sorry, if our word "subsidiary" was ill-chosen, too narrow or specific. To be more precise we might better have said that Morton holds a substantial stock interest in Ringwood and that Ringwood is preferably referred to within the Morton organization as an "associate" or "affiliate."—ED.

Too Much Politics?

TO THE EDITOR: I would be able to do my job without CHEMICAL WEEK but it would be harder. The thing I particularly like about the magazine is the way it presents the essential news in a concise size . . . which can be easily read in a single evening . . .

On the other hand, the thing I don't like about CHEMICAL WEEK is its continual reporting of regular political news. This has a slightly different slant, but not enough to justify it with the existence of so many good newspapers and newsmagazines . . . By eliminating this you would have room for more chemical news, or possibly as valuable, you could make the magazine an even handier size.

THOMAS HICKS
Salt Lake City, Utah

Francophobe

TO THE EDITOR: You prefaced your article on the French chemical industry (*May 29*) with the statement, "Don't judge the strength and vitality of the chemical industry in France by the shakiness of the French government . . . " It has been my personal observation that the "shakiness of the government" is but a manifestation of the French attitude toward all constructive activity . . . One has but to travel from Germany to France to go from one extreme to the other of modern progress. Whereas the Germans have an impressive heavy industry and are well developed in such fields as modern plumbing, . . . the French, if they have them at all, are slow about it, to say the least. Very uncommon in France is anything approaching the most modest American bathroom or kitchen. Apparently the French feel that attention to such things as wild abstract art, extravagant burlesque, and riots is more important than building a progressive community.

CLYDE RICHMOND
Des Moines, Iowa

Fluoridophobe

TO THE EDITOR: I don't know how much the chemical business stands to make out of selling fluoridation to all the cities and persuading them to poison the people with this expensive chemical. It must be more than people realize, though, to cause them to push such an obvious fraud so hard. I'll never know how they can persuade all these city councils to spend public funds on something that isn't healthy for people and runs against so many people's religions.

I think there ought to be a Congressional investigation into this unconstitutional fluoridating, which destroys the American way in so many things like freedom of religion, freedom to drink what you want to, and representative government.

MRS. O. M. BAXTER
Eureka, Calif.

DATES AHEAD

American Society for Testing Materials, annual meeting, Sherman and Morrison hotels, Chicago, June 13-18.

National Fertilizer Assn., annual meeting Greenbrier hotel, White Sulphur Springs, W. Va., June 14-16.

Drug, Chemical and Allied Trades section, N.Y. Board of Trade, spring luncheon meeting, Commodore hotel, New York, June 17.

American Institute of Chemical Engineers, special meeting on nuclear energy, Univ. of Michigan, Ann Arbor, June 20-25.

Chemical Institute of Canada, annual conference and exhibition, Royal York hotel, Toronto, June 21-23.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

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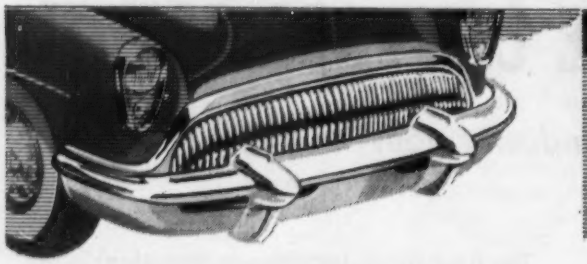
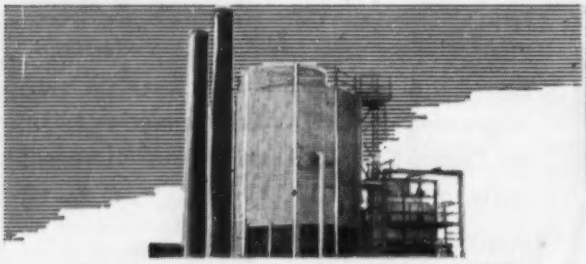
Mutual Chromium Chemicals Cover Industry



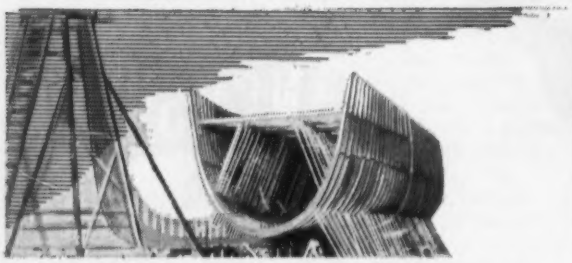
Automobile buyers demand Chromium plating for appearance and protection. Mutual supplies the plating industry with chromic acid assaying 99.75% plus.

Railroads find that Diesel locomotives with chromium plated cylinder liners extend the periods between overhauling jobs. Another application for Mutual Chromic Acid.

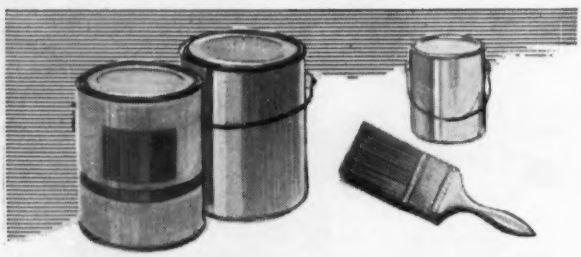


With water becoming scarcer, many industrial users recirculate water in cooling systems. Mutual Chromates effectively control corrosion of equipment.

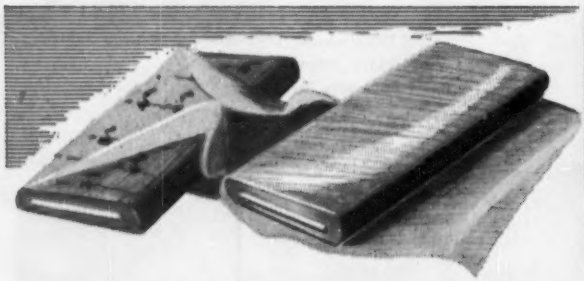
Tanners of superior leather products turn to Mutual for Sodium Bichromate and Koreon (one-bath chrome tan).



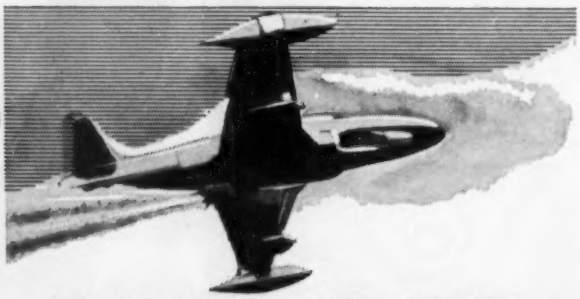
Chromated wood preservatives are specified in an ever-widening list of applications. Mutual Chromates are important ingredients in most such preservatives.



Chrome yellow and chrome green pigments are widely used in paints and printing inks. Mutual Bichromates are the standard of the pigment industry.



Textile dyers rely on Mutual Bichromates for mordanting wool and oxidizing cotton dyes.



Aircraft makers anodize aluminum with Mutual Chromic Acid to prevent corrosion and to form a base for paint.

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SINCE 1845

NEWSLETTER

Air pollution continues to be one of the chemical process industries' most pressing public relations problems. Now the local county medical society has recommended to Seattle's city council that steps be taken to remove "potential health hazards" from the city's air.

The doctors propose that the council appropriate funds to hire an expert "to prepare effective legislation to preserve the purity of Seattle air," carry out a citywide educational program "to inform plant management and the public of the significance of air pollution, the cost to the community and the methods of elimination," and establishment of an air pollution control division as an "appropriate civic department."

And health is not the medical society's sole concern. Additional nuisances pointed out: "expensive cleaning, loss to industry from unburned fuel, damage to truck gardening, difficulty for air lines, and even involvement of the tourist trade."

•

Shell Oil's new $1.7-million, 4,500-bbl./day Platforming unit at Martinez, Calif., which went onstream last week, has one strictly chemical angle. The oil company is building a pipeline to carry by-product hydrogen to Shell Chemical's ammonia plant at nearby Pittsburg, Calif., where it will partly replace hydrogen derived from natural gas.

The new unit is the second Platformer on the West Coast (first was Standard of Cal's at El Segundo, Calif.), but three more are under construction—by Union Oil, Tidewater, and another by Shell. Higher octane requirements are behind the trend, since improvement by tetraethyl lead addition has reached the legal limit (3 cc./gal. of gasoline).

•

Shell Chemical is reportedly buying out Lac Chemicals, Inc., Los Angeles. Neither company will confirm or deny the deal, but West Coasters guess that the effective date will be about July 1.

Lac makes fermentation alcohol, and Shell will doubtless continue to make some of it at Los Angeles to fulfill Lac's contracts—mainly with vinegar makers, who prefer fermentation over synthetic. But it's also likely that Shell will eventually switch its West Coast customers to synthetic shipped from its Houston plant.

•

All the talk about atomic power has infected get-rich-quick enthusiasts with speculative fever. Uranium mining stocks—selling from a cent or two to a dollar or two a share—are being traded on Salt Lake City's over-the-counter market at a dizzy pace of 7 million shares a day (three times the average day's trading on the New York Stock Exchange).

One issue was introduced at 1¢, was soon selling for 6¢. But there's little value behind most of the shares; few of the companies have proved deposits or are producing from them—most of them simply have exploration rights.

Wall Street brokerage houses are worried by the frenzy, fear the effect of a collapse on worthwhile stocks. At least one house has cautioned its brokers not to recommend any of these "penny" stocks, and to dissuade their customers from buying them.

As Congress sprints toward the tentative July 31 finish, legislation affecting the chemical process industries is being completed at an accelerated pace:

• The Senate last week approved continued operation for another year of the government's tin smelter at Texas City (CW Newsletter, June 5). Assuming that the resolution will also be approved by the House and by President Eisenhower, Alexander ter Braake, president of the operating firm, Tin Processing Corp., decided to relinquish direct supervision, devote his time to studying the possibility of taking over the operation from the government and run it as a private industry.

• Air pollution aid is included in the housing bill approved by the Senate last week and sent to Senate-House conference. The Senate wrote in provisions for a $50-million loan fund to be used for the purchase of pollution abatement equipment and a $5-million fund to finance research on pollution causes and control.

• Depreciation policy has been pulled and hauled in all directions. Now the Senate Finance Committee has approved a change in the omnibus tax bill that permits speeded-up depreciation on a new plant's entire cost. The House-approved version permitted it only on costs incurred since last Jan. 1. Both the House and Senate Committee agree on depreciation rate—two-thirds of the value in half the useful life. But the House provision requires write-off of the last third to continue until the plant is scrapped, while the Senate committee revision permits writing it off within the plant's useful life.

• Largely overlooked in the squabble over atomic energy legislation is a significant liberalizing of information rules. The legislative draft allow access to restricted data to employees of participating corporations while their security checks are still in progress.

• National Science Foundation is now completing its final contract for a complete survey job on U. S. research. The year to be covered is 1953, although some current-year data will be collected.

• Food & Drug Administration didn't fare well with the House Appropriations Committee, which cut its next year's budget $152,800 below this year's which in turn was $400,000 below the preceding year's.

•

Two new plants started to produce this week:

Iso-octyl alcohol began to flow from Gulf Oil's 9-million-lbs./year plant at Port Arthur, Tex. The Oxo process can be adapted to make other alcohols—nonyl, decyl, tridecyl, etc.—on demand.

Formal ceremonies marked the opening of American Cyanamid's Fortier (La.) plant. Now turning out sulfuric acid, oxygen and ammonium sulfate, the facilities will soon produce acetylene, hydrogen cyanide, ammonia and acrylonitrile.

•

Early reports of explosion and fire damage at Carbide and Carbon's Institute (W. Va.) plant were highly exaggerated. There were no fatalities, only seven employees were still hospitalized three days later, and damage was confined to nonproduction areas. The full work crew started cleanup operations early this week so that full production could be resumed within a few days.

•

Cork confronts chemical competition: Dewey and Almy has a new resin, now in initial commercial use, that replaces cork liners in certain types of bottle caps.

. . . The Editors

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Hercules' business today helps almost everyone's business. It embraces the production of synthetic resins, cellulose products, chemical cotton, terpene chemicals, rosin and rosin derivatives, chlorinated products, and many other chemical processing materials —as well as explosives. Through close cooperative research with its customers, Hercules has helped improve the processing or performance of many products. We welcome the opportunity to work with you.

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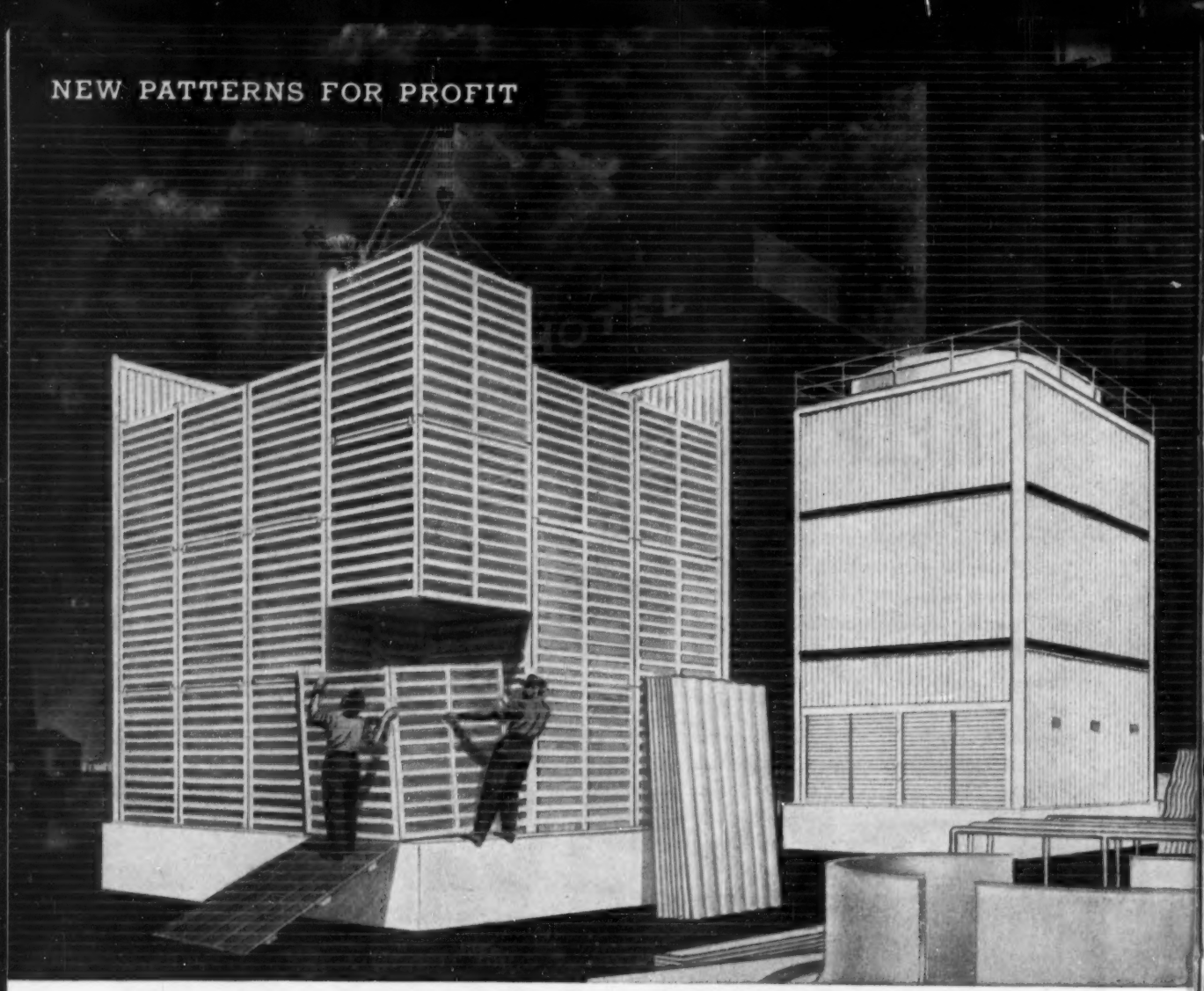

Will Water Cooling Towers of Reinforced Plastic Cut Upkeep Costs . . . Last Years Longer?

Polyester glass fiber laminate may be the answer . . . where highly alkaline cooling water delignifies wooden towers . . . and where building codes prohibit wooden towers as a fire hazard. The same materials now used for chemical storage tanks, sport cars, corrugated translucent building panels, and molded boats might be uniquely suited for cooling towers . . . designed with simple molded components that could be quickly erected. With colored resins, such a tower would be highly attractive for theatre and hotel air conditioning.

Reinforced plastics are strong, rotproof, and corrosion resistant. Monsanto customers produce fire-resistant resins for bonding fibrous glass moldings which would make reinforced plastic cooling towers noncombustible.

Note the construction of the cooling tower shown.

It is self-supporting with heavy corrugated panel sides; no columns are needed. "Filling" can be continuously extruded. Monsanto customers can custom mold the tower components—and remember only ten moldings are needed.

Firms ***using*** cooling towers or cooling tower ***manufacturing*** companies who would like to investigate the possibilities of a reinforced plastic tower are invited to contact Monsanto.

If you would like a set of engineering drawings that shows the tower's components, its assembly, side panels, roof and typical filling section . . . send $1.00 to cover cost of handling and mailing to **MONSANTO CHEMICAL COMPANY,** Plastic Division, Dept. C, Springfield, Massachusetts.

Monsanto is a major producer of **STYRENE MONOMER, PHTHALIC** and **MALEIC ANHYDRIDES, FUMARIC ACID,** basic raw materials used in the manufacture of polyester resins.

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ALLIED'S EMMERICH: Next year's MCA board chairman.

Pause for Reflection

Mellow spring weather smiled on 630 members of MCA and SOCMA attending the annual spring outing at The Greenbrier, White Sulphur Springs, last week. Elected new chairman of the board of MCA: Allied's Fred Emmerich.

But the get-together wasn't all golfing and relaxation. Holding their business meeting over the swimming pool (the grand ballroom wasn't big enough, the hotel laid a plywood floor over the pool, and hastily christened it the North-Wing Auditorium), members agreed to up their budget 5% next year. Important item: $15,000 to publish a manual on pollution.

Later that same day members heard Clarence Larson, pinch-hitting for Lewis Strauss, chairman, Atomic Energy Commission, toss the problems of the atom squarely into the lap of the chemical industry. Said Larson: atomic energy plants of the future will be designed and manned by chemically trained personnel (30% of AEC's technical payroll is now chemically trained). It's up to the industry to take the lead in present research and fabricating techniques. Each and every company must decide *now* the extent to which it can afford to participate, and make its plans accordingly. Five years from now, he warns, it will be too late.

Industry Posers: Other problems also loom in the months ahead. Management must pay more attention to workers' attitudes, warns Carroll French, president, Industrial Relations Counselors, Inc. The industry sorely needs better communications—both up and down the line, and must soon face up to the threat of general unionization of scientific personnel.

Another sober suggestion, voiced by Cyanamid's Robert Swain: because there's a serious lack of correlated chemical data, MCA could render a service to industry by promoting the compilation of physical properties of all known chemicals, make the data available to chemical producers and other industries alike. But since cost is an item (spokesmen calculate the project would cost close to $40,000), MCA will first canvass its own members to determine what information is easily available, then decide whether to go ahead or not. How heartily individual companies cooperate looms as a decisive factor when the suggestion comes to a vote.

Opportunity Widens

In the light of Admiral Lewis Strauss's testimony before the Congressional Joint Committee on Atomic Energy last week, the chemical industry seems to have made an impression on current commission thinking. Reason: present amendments under consideration represent a switch—away from the conception of nuclear power in terms of simple electrical power, and toward the type of nuclear power technology most attractive to chemical firms.

This, as industry well knows, is the type of philosophy that Monsanto and Dow have long nurtured, holding that the way to foster private backing of atomic development is to encourage thinking in the direction of possible sale of weapon-grade plutonium and isotopes.

Indicating that it has already held discussions with industrial groups interested in such reactors, the AEC maintains that the first step in initiating such a program would be to determine the economics of triple-purpose plants. If the results look promising, the commission would then proceed to build (or encourage private industry to build) one or more such plants.

WIDE WORLD

AEC'S STRAUSS: New tack in nuclear power thinking?

Compulsory Licensing: Strauss urges, however, that patents arising in the early stages of atomic power be subject to compulsory licensing for general use. As now written, legislation would treat such patents in the same manner as those arising from other industrial activity, and the procedure's been endorsed by industry generally.

Essentially, the new draft of atomic power legislation carries these provisions of significance to the chemical industry:

- AEC would be empowered to license private firms for research, development, construction, and operation of nuclear-fuel plants.
- The government would hold title to all fissionable fuel—either used or produced in all plants, would pay for the production of all such material on a "fair value basis."
- AEC would continue to have regulatory power over production and distribution of isotopes for use in chemical processes, but would have the right (if it deemed advisable) to exempt some isotope items from such control.

WIDE WORLD

REP. HINSHAW: On alien property, time for an abrupt about-face?

Reversal on Vesting

Some day, Congress might get around to changing the Trading-With-the-Enemy Act so that companies seized during wartime—like General Aniline & Film Corp. and General Dyestuff Corp.—can be restored to private ownership without too much more red tape.

But as of this week, the outlook is that Congressional wheels won't be spinning very swiftly on this business during the current session. The subject turned up again because the war claims subcommittee chairmanned by Rep. Carl Hinshaw (R., Calif.) was trying to find time—either this week or next—to hold public hearings on about 20 House bills and three bills referred from the Senate, all dealing with various aspects of alien property.

What seems to have quickened the Hinshaw committee's interest in this long dormant topic is that the newest bills call for a complete turn-around in U.S. policy on alien property. These bills—introduced last month by Sen. Everett Dirksen (R., Ill.) and Rep. Katherine St. George (R., N.Y.)—include as major provisions:

- Prompt return of confiscated property to former owners, providing that they have not been convicted of war crimes.
- Direct appropriation of whatever money may be needed to pay veterans' claims arising under the War Claims Act of 1948.

Conflict on Claims: At first glance, that second point might seem to be unrelated to the problem of what to do with vested property; but this is actually of fundamental importance in the situation. At present, proceeds from the sale of alien property are being used to satisfy those claims for veterans; if the remaining property is handed back to its former owners, the government will have to use tax money to pay those claims. This, of course, presents another ticklish election-year dilemma for congressmen.

Under the Dirksen-St. George bills, the President would appoint three members of a vested property commission that would handle all claims for the seized assets. No property would be returned to any former enemy nationals who now reside in Soviet-controlled nations, and the President would have power to order that any vested property be sold to U.S. citizens or companies if he found this to be in the national interest.

That "national interest" clause would likely be used in the GAF case if these bills should be enacted into law; it's probable that the U.S. government would want such a large company—with considerable defense production potential—in American hands.

Higher on the Congressional priority list are veterans' benefits and other "must" legislation that's expected to force still another postponement in consideration of bills that would pluck GAF from the limbo of government control.

Big Gets Bigger

Allied Chemical & Dye Corp. made the first move in its anticipated (*CW, June 6, p. 12*) program of acquisitions last week with the completion of negotiations for all of the outstanding stock of Mutual Chemical Co. of America, Baltimore. Subject to approval by Mutual stockholders, it's expected that final transactions will be completed sometime this summer.

Allied's leap into the chromium chemical field (at present Mutual is a principal U.S. producer) rounds out the company's line of products for sale to the pigment, tanning and plating industries, gives it immediately available facilities and foreign sales outlets.

Present plans call for no change in Mutual's operations, sales or distribution policies, but according to Mutual president, George Benington, the merger "should improve and strengthen the 109-year-old company's base for expansion."

Principal items now produced by Mutual: bichromates, chromates of soda and potash, chromic acid, chromium sulfate, sodium sulfate.

WIDE WORLD

PERU'S BERCKEMEYER: Gravely concerned over tariff hike.

Call for Diplomacy

Caught in a squeeze play over the controversy concerning lead and zinc tariffs, President Eisenhower faces a ticklish problem this week. On the one hand, the protests of U.S. miners are increasing; and on the other, Peruvian diplomats are agitated and vociferous. To make matters worse: compromise isn't a likely possibility—since either side would regard it as a major defeat.

Bringing the situation to a head was the U.S. Tariff Commission, which forwarded its recommendation for a 50% hike in zinc and lead tariff rate to the White House for action before July 20. Back of its stand: a recent report to Congress outlining how seriously imports have injured miners.

Initially, the miners applied for higher tariff early last September and they realize full well that under present U.S. law 50% rate increases can be allowed. Admittedly, they've been awaiting the commission's report before launching an all-out drive for Presidential support.

The reaction of the Peruvian ambassador was instantaneous. Calling on Assistant Secretary of State Henry Holland, Fernando Berckemeyer expressed Peru's "gravest concern over the move." Further, he noted that 25% of Peru's dollar income today is derived from sales of lead and zinc to the U.S.—that any sudden decrease in that market would cripple the Peruvian economy "beyond imagination."

Understandably, for Eisenhower, it will be a situation that calls for a deft touch.

WIDE WORLD

PLANT-SELLERS COOK, PETTIBONE, ROUNDS, HOLLAND: Past first hurdle.

Many Bids, Many Barriers

"So far so good," members of the commission set up to sell the 27 remaining government-owned synthetic rubber plants are saying this week. Chairman Holman Pettibone and Commissioners Everett Cook and Leslie Rounds feel that they've taken the first hurdle in their two-year task of putting the plants under private ownership while still protecting the taxpayers' investments—they received 75 specific bids on the plants, including 19 alternate proposals.

Thus the response on the part of chemical, rubber and petroleum companies has turned out to be fully as enthusiastic as had been predicted by the man who led the fight to end the government's virtual monopoly in synthetic rubber, Rep. Paul Shafer (R., Mich.) And many Washington observers are still stringing along with Shafer's estimate that the sale will bring in some $300 million—about midway between the plants' $550-million construction cost and their present $180-million book value.

Reticence the Rule: In general, the commission and the bidders were secretive about the bidding, except that the commission's Executive Director Eugene Holland released a list of the companies that submitted bids. CW, however, garnered these curiosity-whetters:

- One responsible official characterized the bidding thus: "Some of the bids are very good and some are poor."
- Monsanto let it be known that it bid on the styrene plant at Los Angeles; and another bidder on that plant was American Chemicals Corp., a new firm jointly owned by Stauffer Chemical and Richfield Oil. Dow Chemical—which has been operating this plant for the government—refused to say which plants it had bid on.
- Among proposals submitted for the butadiene-from-petroleum plants, one came from the General Chemical Div. of Allied Chemical & Dye; another was a joint offer by Merck and Climax Molybdenum, both of which explained that they want to continue their diversification programs. Merck added that "butadiene is a highly reactive chemical that may have possibilities in other fields."
- The commission conceded that most of the bids were for the 13 GR-S plants and the eight petroleum butadiene plants; and it was rumored that the latter category drew more bids than the former.

Big Four Prestige: All of the "big four" rubber companies—Firestone, Goodyear, Goodrich and U.S. Rubber—were in on the bidding, and it was assumed that each one of them would try to buy at least one large GR-S plant for reasons of competitive need and prestige. Among the chemical concerns that had helped fill the nation's synthetic rubber requirements during wartime, all except Union Carbide took part in the bidding.

The Rubber Producing Facilities Disposal Commission now moves into a more difficult phase of its work—negotiating sales contracts that will satisfy all the requirements laid down by Congress last July. The sales must be for "full and fair value"; there must be no taint of monopoly; and the sale must include enough plants so that total production capacity will be at least 500,000 long tons of GR-S and 43,000 of butyl rubber. The commission has until Dec. 27 to negotiate with the bidders, then must hand up to Congress an over-all disposal plan.

Fifteen long-time chemical companies are among the bidders. Thus, while rubber companies have been expanding eagerly into chemical production (*CW Feb. 13, p. 20*), chemical firms aren't overlooking rubber in their diversification planning.

Scientists Preferred

More light and less heat should emanate from discussions about the supply-and-demand situation on technically trained manpower, now that the Bureau of Labor Statistics is making public its report on employment of chemists and chemical engineers in the three industries that make the biggest use of such personnel—chemicals, petroleum, rubber.

In essence, what this report shows is that these industries are employing an ever-increasing proportion of scientists and engineers, so that there's definitely brisker competition among chemical, oil and rubber companies for promising scientists and engineers. For the 90 large companies that were polled in last winter's survey, employment figures ran like this:

	1953	Increase, 1948-'53
All employees	827,194	12.0%
Chemists	18,328	25.8%
Chem. engineers	14,586	42.1%
Other scientists and engineers	22,029	52.0%

Thus it appears that for these companies, the road to expansion led past numerous university campuses where graduate scientists and engineers could be recruited to enrich the companies' personnel rosters. This process followed different patterns in the three industries surveyed. In the chemical firms, employment of chemists rose by 27.6%; chemical engineers, 45.1%; other scientists and engineers, 61.9%. Petroleum concerns boosted their employment of chemists by 25.8%; chemical engineers, 39.3%; other scientists and engineers, 44.0%. For the rubber firms, increases were 5.6% for chemists, 25.8% for chemical engineers, and 46.1% for other scientists and engineers.

The BLS report goes into detail about how these companies are using their technically trained manpower. One deployment trend pointed up: greater use of scientists and engineers

in administration and sales work. For example, the petroleum companies reported that they had 43.5% more chemists and 62.3% more chemical engineers in technical sales jobs; and the chemical companies said they had 29.5% more chemists and 61.7% more chemical engineers in administrative positions.

The general conclusion of this report—that most large companies have been having difficulties in hiring the technical personnel they want—won't surprise anybody.

But this report isn't an end in itself; BLS is using it as the start of a project that might turn out to be even more helpful to industry in the long run. The bureau hopes this study will tell whether the U.S. is doing all it should to encourage the training of engineers and scientists—and exactly what must be done to see that the country's personnel needs for both industry and national defense are met.

EXPANSION. . . .

Carbon Dioxide: The Liquid Carbonic Corp. will build a new carbon dioxide plant in Houston, Tex., on the Houston Ship Channel. No cost nor estimated date of completion has been released.

•

Alkyd Resins: Back of Archer-Daniels-Midland Co.'s purchase of the resin division of National Distillers Products Corp. last week (*CW Newsletter, June 5*) lies a dual expansion plan.

Spokesmen for National Distillers say the decision to sell the division developed out of the company's intention to concentrate on expansion in petrochemicals, while Archer-Daniels points out that its purchase was a move in the direction of vertical integration. Says ADM's Thomas Daniels: "Our move was a natural . . . since (as a result of the purchase) we gain facilities (to produce linseed oil, soybean oil, fatty acids and glycerine) needed as raw materials to produce alkyd resins."

COMPANIES. . . .

Linde Air Products Co. has awarded the contract for the initial construction work on its $17-million silicone plant outside Sistersville, W. Va., to Baker and Coombs, Inc., Morgantown, W. Va. No dollar value on the contract has been released, but work is expected to start this month, will take close to 18 months.

•

All commercial yarn manufacturing at American Viscose Corp.'s Marcus Hook, Pa., plant has been discontinued. Reason given: the textile industry is not offering enough business for all of the existing capacity of the rayon industry. Approximately 1,000 employees will be affected by the move, but research departments and other units at Marcus Hook serving the company's other rayon, acetate and cellophane plants will continue to operate.

•

American Cyanamid Co. has offered its common stock holders the right to subscribe to 585,000 shares of convertible preferred stock. No immediate expansion plans, management states, are connected with the offering.

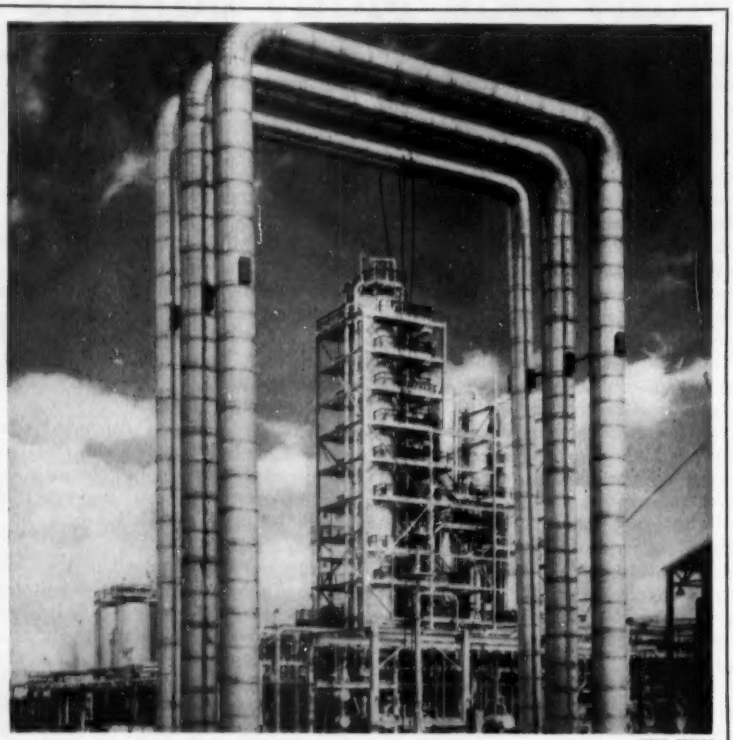
•

Penn-Texas Corp. (formerly Pennsylvania Coal & Coke Corp.) has purchased all of the outstanding stock of A&B Mining Co.—including its leaseholds covering uranium rights on 2,000 acres on the Navajo Reservation near Flagstaff, Ariz.

Dow Chemical Co., Midland, Mich., has acquired a 7,600-acre tract of land in the Grand Valley area, 50 miles east of Grand Junction, Colo., through its purchase (for $1.5 million) of 85% of the stock of the Columbia Oil Shale Refining Co. Local spokesmen say this marks the "first time a chemical company has shown interest in refining the estimated 100 billion bbls. of oil locked in the flinty shale." Dow's property lies between oil shale reserves of Union Oil Co. of California —now engaged in the current east-west Colorado water dispute, and also the Colorado River storage project.

•

Tennessee Products and Chemical Corp. stockholders have approved a company proposal to increase the number of shares from 500,000 to 620,000. Also aproved: a plan to acquire the Sommerville Iron Works, Chattanooga, and that concern's 50%-owned subsidiary, Tennessee Pipe Co.



WIDE WORLD

Credit for Determination

BRITAIN'S newest refinery, the Coryton Refinery of Vacuum Refining Co., is now processing close to 1 million tons of crude oil annually, contributes a host of chemicals to England's rapidly expanding capacity.

The furfural units (seen above through expansion bends in the utility pipetracks) process lubricating oil stocks, remove unstable materials; water intake pipes carry over 45 million gal. of water daily to the plant site. For Britons, it's a major step ahead on the road to economic stability.

FMC CHEMICALS

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East and west, north and south, twenty-seven FMC Chemical plants and mines in sixteen states now dot the country in strategic spots to serve great industries.

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New York, New York	Buffalo, New York	Middleport, New York	Nitro, West Virginia	New York, New York
Alkalis, Chlorinated Chemicals, Carbon Bisulphide	Peroxygen Chemicals	Insecticides and Fungicides	Plasticizers and Chemicals	Phosphates, Barium and Magnesium Chemicals

Here Are the Top Ten Mutual Funds' Holdings of Industrial Chemical Common Stocks

(dollar figures in millions)

	1949			1951			1953		
	Shares	Market Value	% Net Assets‡	Shares	Market Value	% Net Assets‡	Shares	Market Value	% Net Assets‡
Air Reduction	24,000	$ 0.55	0.06	69,500	$ 1.8	0.11	144,500	$ 3.3	0.15
Allied	23,000	4.7	0.48	90,800	6.8	0.41	114,700	8.3	0.37
American Cyanamid	64,400	0.31	0.03	67,000	7.9	0.47	128,100	6.0	0.27
Atlas	5,100	0.27	0.03	9,500	0.40	0.02	17,100	0.64	0.03
Commercial Solvents	60,500	1.2	0.12	42,900	1.3	0.08	74,000	1.3	0.06
Davison	—	—	—	26,500	1.2	0.07	—	—	—
Dewey and Almy	—	—	—	55,000	1.4	0.08	56,000	0.97	0.04
Diamond Alkali	—	—	—	69,800	2.6	0.16	79,000	2.2	0.10
Dow	90,725*	4.0	0.41	76,056*	7.7	0.46	171,200	6.5	0.29
Du Pont	134,400	8.0	0.82	113,000	10.4	0.62	197,300	21.0	0.94
Hercules	79,400	4.0	0.41	49,000	3.4	0.20	57,000	3.8	0.17
Hooker	—	—	—	—	—	—	9,200	0.53	0.02
Mathieson	—	—	—	22,000	0.98	0.06	56,000	2.2	0.10
Monsanto	100,600	5.5	0.57	135,600	14.0	0.83	131,000	11.0	0.48
Pennsalt	—	—	—	9,300	0.63	0.04	20,000	0.83	0.04
Rohm & Haas	—	—	—	7,384	1.1	0.07	6,600	1.0	0.05
Spencer	—	—	—	24,500	1.1	0.07	44,700	2.6	0.12
Union Carbide	156,400	6.6	0.67	147,000	9.1	0.54	172,000	13.0	0.56
Victor	24,000	0.92	0.09	91,500	2.9	0.17	81,000	2.2	0.10
Total:		$36.2	3.69		$74.6	4.46		$86.8	3.89

‡ Combined total net assets of 10 mutual funds: $980 million for 1949, $1.67 billion for 1951, $2.23 billion for 1953.
* Includes rights.
Stock splits, stock dividends, exercise of rights and conversion of preferred into common stock are reflected in share holdings.

Chemicals: Moving Up Strongly

The chemical industry is fast emerging as a favorite with the professional investors who manage the nation's open-end mutual funds. At the beginning of 1954, these investment groups had become one of the significant barometers in the stock market; the judgment of their experts in appraising the potential of industries is followed closely.

The nation's top 10 mutual funds, which together boast net assets of $2.23 billion (more than half the total for all open-end investment trusts), have a big stake in the chemical industry (*see above*). Although oil and natural gas stocks, traditional favorites with the funds, are still tops—with utilities in second place—chemical stocks are moving up steadily, are now third. And they may soon be challenging the second-place utilities.

The 10 trusts have more than doubled their holdings of common stock in industrial chemical companies since the beginning of 1950—up from $36.2 million to $86.8 million at the outset of 1954. Nor does this include their participation in such closely allied industries as pharmaceuticals, soap, photographic chemicals, mining, and others that elude precise classification.

Prime Favorites: Du Pont is by all odds the funds' favorite today. From fourteenth position (in value of shares held) it's jumped to second spot in investment company holdings.

Massachusetts Investors Trust, largest of the funds, has the biggest share of Du Pont—$11.3 million. Although it holds only $941,688 of DuPont common, Investors Mutual (second largest of the 10 trusts) has $3.27 million of Christiana Securities, the Du Pont holding company.

Union Carbide, with $36.5 million owned by trusts, is also heavily favored. The 10 funds cited above have doubled their holdings of Carbide common since the beginning of 1950—from $6.6 million to $13 million. Massachusetts Investors alone holds $5.9 million.

All investment companies own $24.3 million of Dow and $21.1 million of Monsanto. The 10 largest funds together have a $6.5-million stake in Dow and an $11-million interest in Monsanto.

Newcomer among the favorite 50 stocks of mutual funds is Allied. All funds hold $16.8 million of Allied (2.59% of outstanding shares). Of this total the big 10 trusts now have $8.3 million, compared with only $4.7 million at the end of 1949.

Further: shares of Spencer Chemical held by the investment companies have increased steadily since the company broke into the list. The 10 top funds own $2.6 million of Spencer today—more than double their 1951 holdings. Holdings of Mathieson and Diamond Alkali now total $2.2 million each. Other major purchases: Rohm & Haas, Pennsalt, Dewey and Almy, Hooker shares.

Not only are the funds increasing their investment in chemicals, they are also broadening the spectrum of chemical stocks they acquire. Wellington Fund, for example, has diversified from the three chemical stocks it held in 1949 to 11 this year. Incidentally, Dividend Shares has the biggest percentage of its net assets invested in chemicals—7.7%. Massachusetts Investors, with 6.7% of net assets in chemicals, has the largest dollar holding—$34.8 million.

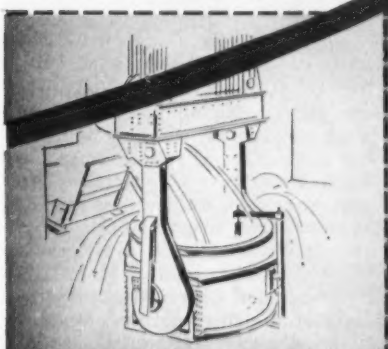
Although the percentage of total net assets invested by the big 10 in chemical stocks hasn't varied much from 4%, the dollar value of their stake has risen to almost $90 million. Such mounting investment in chemical companies by the professionals who manage the savings of the nation's small investors rings a continued assurance of their faith in the future growth of the chemical industry.

* Massachusetts Investors Trust, Investors Mutual, Affiliated Fund, Wellington Fund, Fundamental Investors, Incorporated Investors, Dividend Shares, State St. Investment, Boston Fund and Fidelity Fund.

What has *aluminum* got to do *with...*

Salting an egg?

Purification of water?



Making steel?

Raising potatoes?

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Alcan (Aluminum Company of Canada, Ltd.) offers industry the basic chemical ingredients used in ingot production and other chemicals associated with the aluminum processes. Many of these Alcan Chemicals are regularly used by industry to improve process applications and product quality.

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Co-operating in the production of Alcan Chemicals are a number of affiliated companies. Each of these sister companies specializes in its own field of endeavor such as: Laboratory research . . . exploring, mining and processing raw materials throughout the free world . . . development of shipping methods for the protection and speedy delivery of products.

One of Alcan's sister companies, Aluminum Import Corporation, distributes Alcan Chemicals in the United States. The *Import* office near you will be glad to help you with your special chemical requirements.

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- Aluminum Chloride, Anhydrous
- Aluminum Fluoride
- Aluminum Sulphate
- Bauxite
- Chlorine, Liquid
- Cryolite, Artificial
- Fluorspar
- Lime
- Magnesia
- Magnesium Chloride, Anhydrous
- Sodium Fluoride
- Sulphuric Acid

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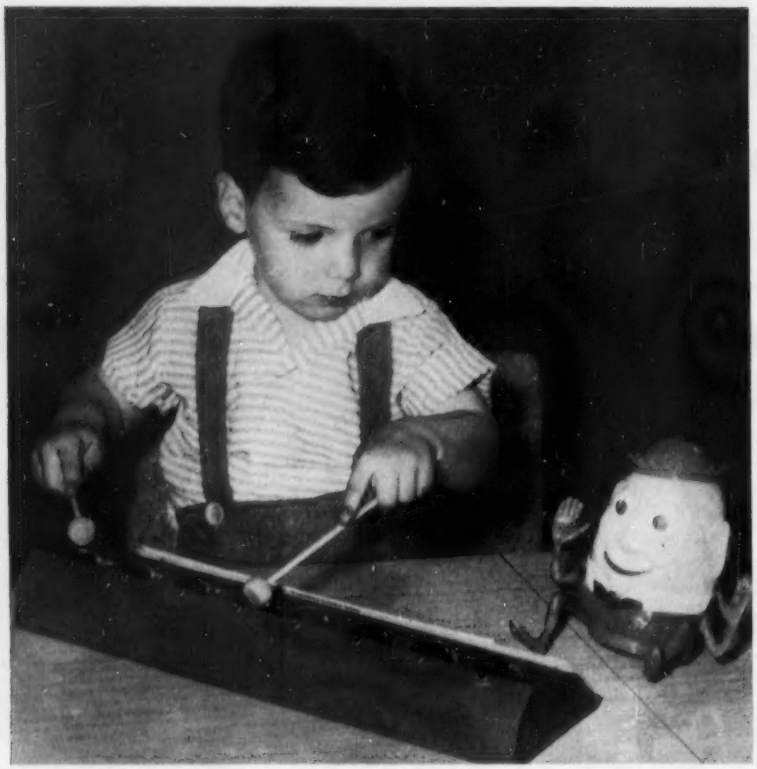

PRODUCERS ASK: How seriously has misapplication soured children on plastics?

Cause for Concern

Ask just about anyone what he thinks about the plastics business and he'll come back with a pat, prompt reply: it's big, bustling and harbors a glowing future. And there are solid facts to underpin any such roseate view—total plastics output is now coursing along at a 3-billion-lb./year rate, and is heading upward.

But bright as the over-all picture seems, cheerful as the prospects are, not a few plastics makers will admit —privately—that they're running into heavy water in one quarter—sale of plastics to toy manufacturers. Basic reason: the long-time misapplication of plastics-in-toys has dulled consumer enthusiasm, buttressed their sales resistance. And adding to the problem: reaction of today's children —who will be tomorrow's major plastic buyers—is bound to be soured by a parade of broken toys.

To plastics producers, such reaction is nothing to be toyed with. Total sales of toys in the U.S. hit an all-time peak last year ($900 million), and is scheduled to at least equal the same sales volume this year.

Plasticwise, toy molders consumed 60 million lbs. of polystyrene alone in '53 (out of a total of 295 million lbs. produced), are also robust purchasers of cellulose acetate, polyethylene, and a host of other resins.

No Easy Out: Getting at the root of consumer resistance to plastic toys however, is no easy matter. Admits one plastic producer: "You can't expect to do much about overcoming the growing resistance to plastics in toys, unless you increase their durability, and you can't increase durability unless you use higher-impact materials." The plastics industry puts out what's needed, but the big hitch is cost. Bucket-shop operators, lured by the promise of quick profits, look at the price of raw materials first; the reputation of the entire plastics industry is suffering as a result.

Meanwhile, metal toys from Japan are creeping back, are regaining prewar markets; and some plastics producers are frankly worried about the threat.

One of several with the same idea, Monsanto's Plastics Division last year decided to size up the problem logically, and try to determine what could be done about it. From a consumer survey, it learned: (1) that there's little or no consumer dissatisfaction with flexible plastic toys; and (2) most of the trouble with rigid-plastic toys stems from their brittleness.

One answer, then, was a high-impact styrene—3-5 times tougher than the general all-purpose polystyrene used by most molders. Fly in the ointment: although most molders agree that from a quality standpoint, the higher-grade material is infinitely better for their purpose, price is a deterrent. As one molder puts it: "We're ready to use the costlier material (it carries only a 3-5% price differential) . . . but the chain store retailers—our bread and butter customers—won't go along."

From the chain store operator's view, the seemingly "little price difference" is a sales-crippler. Volunteers one buyer: "High-impact styrene in a toy may actually cost only 5¢ more, but if we raise our prices correspondingly, it can have a tremendous impact (psychologically) on sales. Just as an example, imagine what a difference it would make if toys formerly selling at $1.98 were to sell for $2.03?"

Complicated Chore: Misapplication and cost of higher-impact resins aren't the whole problem either. While plastic toys admittedly have certain advantages over metal toys (color, realism), the plastics industry has yet to come up with a material that's considered completely satisfactory by most molders. Each and every type of plastic today has its limitations when used in toy production. High-impact styrene (e.g., Dow's Styron 475 and Monsanto's High-Test 88) is much tougher than the old styrene, but still isn't as tough as metal. Too, it lacks the high gloss of its prototype. Cellulose acetate (Celanese and Hercules) —the first thermoplastic material to be injection-molded—is practically unbreakable, but tends to warp under certain conditions. Polyethylene is "too waxy and hard to paint, can't be cemented, must be welded together."

Plastics people are quick to point out, however, that material is not the only factor determining toy quality. Proper design is just as important.

Such a complex of contrary interests —cost, sales price, quick profit, opportunism, ill-conceived designs—is a tough one for plastics producers to unravel. But they're trying—fully conscious of the long-term business at stake.

Right now plastics salesmen are busy striving to "educate" molders, technical service men are trying to sell the importance of functional design—"the right resin for the right job."

It's an all-out campaign to solve a problem that has dogged and perplexed the plastics business for the past decade.

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GREATER PURIFICATION?

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ROY WEIR: Offers bill—by request.

Fluoridation Field Day

Proponents and opponents of fluoridation had a rousing field day in Washington last week when the House Interstate & Foreign Commerce Committee heard testimony on a bill designed to prohibit (by federal law) fluoridation of municipal water supplies (CW Newsletter, June 5).

From the first, it was clear to even the most myopic fluoridation opponent that the bill (H.R. 2341), introduced by Rep. Roy Weir, (D., Minn), stood little chance of committee approval, and that the hearings were simply a formality—serving to satisfy certain committee members who had been inundated with a flood of requests for fluoridation legislation. Main objection (as had been expected): that any such federal action, on constitutional grounds, would be an encroachment on states' rights.

Nevertheless, the cheering sections were out in force. On hand to support antifluoridation witnesses was a sizable representation of the National Committee Against Fluoridation, Inc. (formerly the Citizens' Committee on Fluoridation, Inc.). And on the other side: the American Dental Assn., the American Medical Society, U.S. Public Health Service, American Public Health Service, state health officials, representatives of the Army Surgeon General, and a host of other interested parties.

Formal statements on the chemical aspects of fluoridation were issued by Farrington Daniels, former American Chemical Society president, Henry Frank, of University of Pittsburgh, and John Bailey, of University of Illinois.

But neither their eloquence nor sober views matched (in vigor) the outbursts of antifluoridation witnesses. Among the charges made: that H. Traendley Dean (secretary of the ADA's Council on Dental Research) committed perjury; that fluoridation of water in Grafton, Mass., was supervised by a 71-year-old mental patient; that the Public Health Service, using government money, supplies municipalities with fluoride-mixing equipment; and that "fluoride is one of the halogen gases . . . that is extremely deadly."

But perhaps the most intriguing piece of testimony came from a man credited with both a B.S. and M.D. degree, director of the Cambridge, Mass., Medical Center. Said Charles Brusch:

- Fluorides are absorbed by the body by such radiation as fluorescent lighting, "chemical rays" and television.
- Calcium fluoride is an organic, "not so soluble substance held together by covalent bonds found in nature."
- Fluorides are a causative factor of a host of diseases—including anemia, bronchitis, cancer, chicken pox, colitis, diabetes, edema, encephalitis, leukemia, measles, multiple sclerosis, mumps, poliomyelitis, and dermatitis.

The statements of the profluoridation scientists certainly lacked the color of such testimony. But observers feel that the House committee, which concluded "that fluoridation safety has been demonstrated beyond any doubt," were, relatively, making the understatement of the day.

A Healthy Record

Well in stride with U.S. chemical companies that scored all-time earnings records last year, Britain's giant Imperial Chemical Industries, Ltd. rounded out 1953 with the highest total sales in the group's history—over $780 million.

Net profits, after taxes, dividends (including those paid to minority members of subsidiaries) and undistributed income of subsidiaries totaled $49.3 million—a 30.4% jump over 1952 profits. During the year ICI spent $83 million on new fixed assets—raising total capital improvement expenditures by the group since the end of World War II to $436 million.

But the over-all growth picture since 1945 is even more impressive. Highspots of domestic expansion include:

- A 50% increase in ICI's soda ash and caustic soda capacity, and a 15-fold hike in polyethylene. In addition: ICI has signed royalty license agreements with Spencer, Dow, National Petro-Chemicals Corp., and Eastman Kodak Co., for the production of polyethylene.
- A 175% increase in chlorine facilities; new titanium metal-producing units, including an ingot plant.
- Reconstruction and expansion of dyestuffs and pharmaceutical facilities, construction of phthalic anhydride, detergent, and nylon polymer plants. Output of nylon polymer alone now stands at 30 million lbs./year—three times 1945's rate.
- Expansion of nitric acid facilities to a total of 111,000 tons/year; a 50% increase in phenol production; addition of 43,000 tons/year to ammonia capacity.
- Modernization and extension of light alloy facilities in South Wales; expansion of metal sheet and strip capacity; increase in explosives production; replacement of open-pan salt production units at Stoke Prior, with a more efficient vacuum process.

Construction's also now under way on a 4,000-ton/year pentaerythritol plant (the output of which will be largely for export). And company spokesmen point to a 55% gain in paint and varnish production, expansion of acrylic sheet production (now 18,000 tons/year), "continued" expansion of polyvinyl chloride facilities, and new plants (planned to produce 10,000 tons of Terylene/year).

ICI's overseas operations are equally rosy. In Africa, recent expansion has included an ammonia plant; easing of exchange regulations in Argentina has meant a "considerable jump in export trade to South America." In the Far East, exports to Japan are on the upswing again; in Europe, "despite growing German competition," sales last year were greater than in 1952.

In Canada, Canadian Industries Ltd.'s turnover was $154 million—up 7% from 1952, but profits remained about the same due to lower profits margins. Parent company officials are openly optimistic about the Canadian subsidiary's outlook this year though—especially "in view of CIL's new $13-million polyethylene plant and a $32-million capacity increase in nylon yarn and staple fiber.

ICI's subsidiary in the U.S. (Arnold, Hoffman & Co., Inc.) still isn't making as rapid strides as other ICI subsidiaries—but its new multiproducts fats and dyestuffs plant is counted on to boost earning capacity soon.

From any angle, domestic or foreign, ICI is painting an intriguing picture.

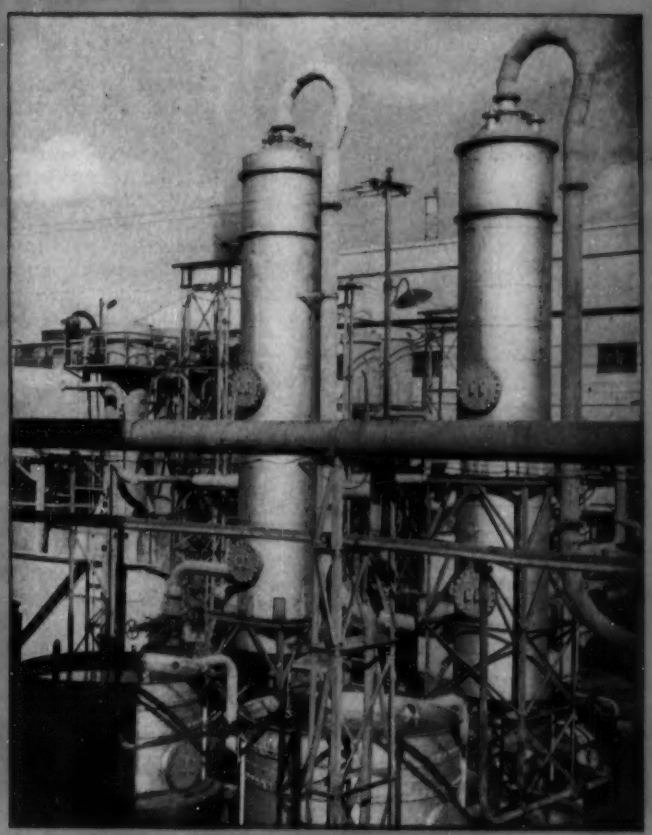
CHEMICO

offers a proven process for the production of

UREA

Chemico's process for the production of Urea is fully proved in actual practice. The overall ammonia efficiency is 97%; conversion of ammonium carbamate to Urea being approximately 76%. The process uses excess ammonia over stoichimetric requirements; the excess being recycled directly without compression.

The market for Urea is large, stable and offers a sound investment opportunity. In the plastics field Urea is the basic ingredient of Urea Formaldehyde Resins. Urea is an ideal fertilizer. It contains 46% Nitrogen. PH is approximately neutral. In the form of 1/16" granules coated with diatomaceous earth, Urea is much less hygroscopic than ammonium nitrate. Nitrogen in Urea is basically cheaper than that available in other solid forms. It is safe to make, ship and handle since it is non-flammable and non-explosive.



This Chemico-built Urea plant of Sumitomo Chemical Co. Ltd. in Niihama, Japan is in full commercial production. Expansion to three times its present capacity is now under way.

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Chemico plants are profitable investments

CAPACITY OUTPUT: Fertilizer from San Giuseppe di Cairo—a major export item.

FOREIGN. . . . . .

Earnings/Montecatini: Montecatini, the Italian chemical collossus, turned in profits of 8,052 million lire last year in comparison with 7,797 million lire in 1952. Average output was increased by 10% last year. Accounting for a major part of the increase: fertilizer production, e.g., from Montecatini's San Giuseppe di Cairo plant (*above*).

•

Morphine, Codein/Austria: The Alkaloid Factory, Tiszavasvar, Austria is now producing various pain-allayers from poppy heads (morphine, codein, ethyl-morphine and heroin) in quantities sufficient not only to supply its own domestic demands, but also (allegedly) to give it first place in world markets as well. A number of Western countries are listed as Alkaloid's best customers. Included: Sweden, Norway, Denmark, Finland, South Africa, Rhodesia, and Indonesia. Plant capacity: 1,000 carloads/year of poppy heads.

•

Titanium Sponge/Japan: According to latest calculations, Japan's titanium sponge export in fiscal 1954 (April '54–March '55) should zoom to 1,123 tons from last year's 65 tons. Of the total export target this year, 777 tons will be headed for the U.S., 97 tons for England, and 249 tons for other nations.

Given special credit for the rise: Osaka Titanium, which expanded its capacity to 25 tons/month and started full operation last April.

•

German Enterprise: West German Economic Minister Erhard's recent Latin American tour has apparently paid off in good public relations for German businessmen trying to recoup markets lost during the war. Latest gesture of renewed goodwill: in Chile, the Government Development Corp. (Corporacion de Fomento a la Produccion) has voted to sell Bayer, E. Merck, and Farbwerke Hoechst AG back to their former German principals. In order to avoid seizure, the Germans had sold the organization that handled these representations to two employees of Chilean nationality, who in turn were forced to sell to Corporacion Fomento.

Present value is estimated at $515,765, but will be assessed by a commission representing both parties.

•

Oil/China: Communist China (according to *Izvestia*) has found a way to successfully produce specialized oils from silk worm pupae, tea seeds, and camphor seeds. Silk worm pupae, states the report, makes good industrial oils, camphor oil is a raw material for toilet soaps, and tea seed oil is also usable in soap production and as a lubricant.

•

Ammonium Nitrate/India: The government of India has decided to set up an ammonium nitrate and urea plant at Sindri. Two firms from Germany, one from Italy and one from the U.S. have replied to the government's invitation to submit bids for construction work.

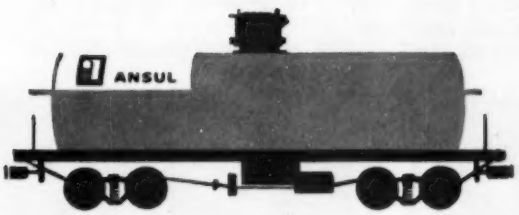
•

Explosives/Philippines: Elizalde & Co., Manila, will build an explosives plant with help from the Vassac Chemical Works, Essen, Germany. Basic raw materials—glycerine and nitric acid—are available in the Islands.

•

Printing Ink/Philippines: The Howard Flint Ink Co. plans to build a plant in the Philippines if dollar exchange problems can be overcome.

ANSUL sulfur dioxide



Product Purity. Since 1915, Ansul has been supplying industry with a near 100% pure grade of liquid sulfur dioxide. During these years, Ansul developed a quality control system for the manufacture of sulfur dioxide that assures users a *consistently* pure (99.9%) product—never off grade, always the finest available.

Personalized Service. When you specify Ansul sulfur dioxide, 39 years of experience in compressed gas application becomes available to help solve your installation and use problems. Ansul personalized service also means prompt delivery of emergency orders—insurance against shut-downs caused by a lack of sulfur dioxide.

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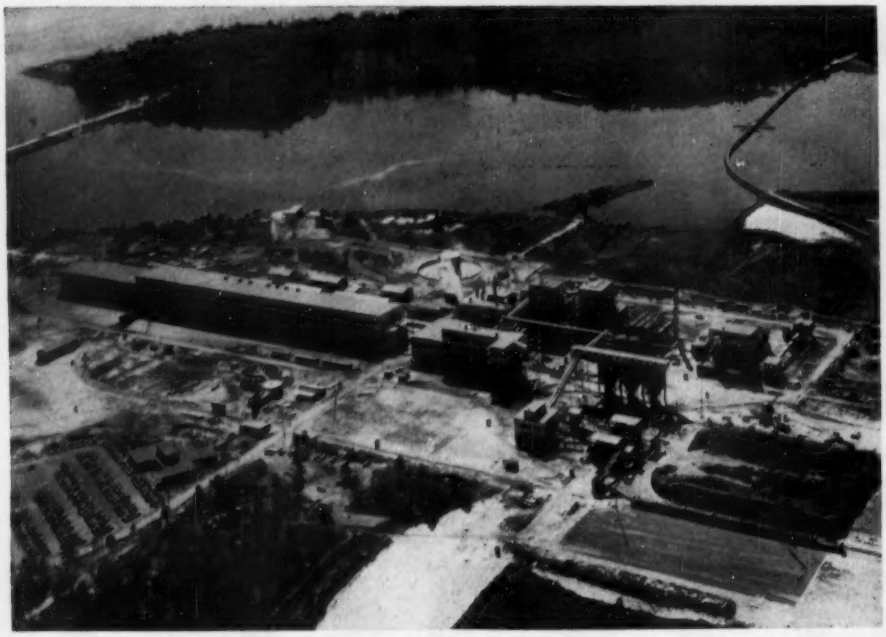
IF your chemical process includes bleaching, acidifying, purifying, fumigating, reducing, preserving, have you fully investigated the advantages of using liquid sulfur dioxide?



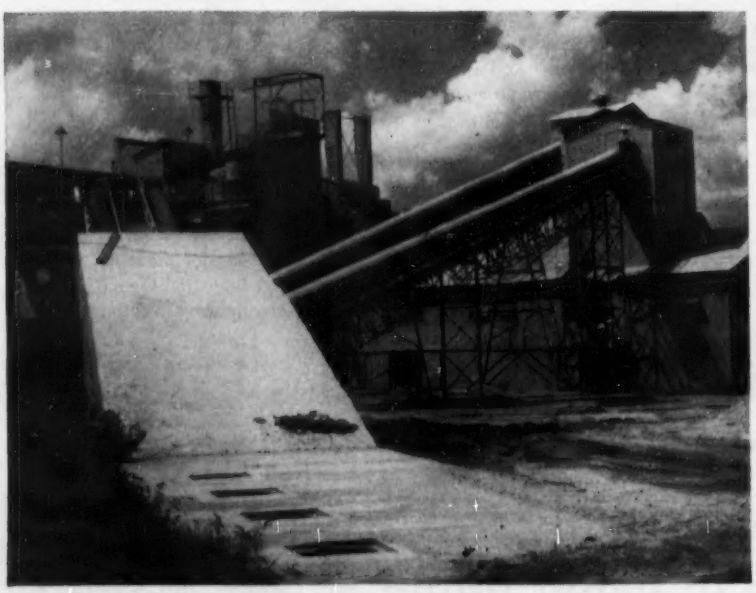
FLORIDA'S FIBERS—including wood pulp for St. Regis Paper at Jacksonville, cellulose pulp for Buckeye Cellulose at Foley, and

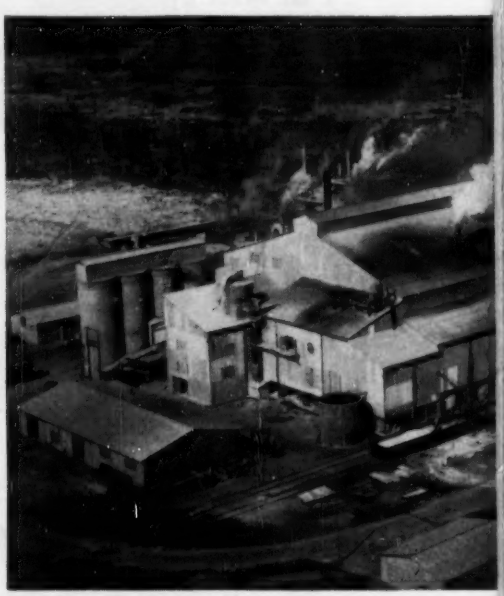
Tourists Welcome, No Longer Needed

This week, as two new multimillion-dollar plants approach full-scale operations that will add 50 million lbs./year of nylon and up to 300 tons/day of cellulose pulp to the productive capacity of Florida's chemical process industries, business-minded natives of that state are exulting over Florida's recent and imminent gains in industrial development.

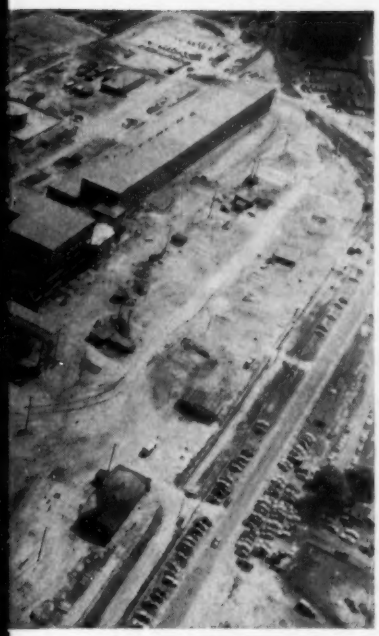
Tourists—who yield the state about $1 billion worth of business a year—are still heartily welcome, accounting for nearly one-third of Florida's gross income. But manufacturing and agriculture now are coming into their own in the subtropical vacation state. As Chairman A. D. Davis of the Florida Council for Industry & Commerce recently remarked, "Floridians no longer have to exist for eight months of the year by taking in one another's washing."

Much of Florida's present chemical





FLORIDA'S PHOSPHATES—with extensive, high-grade deposits in Bartow area being worked by American Cyanamid, Armour, Inter-



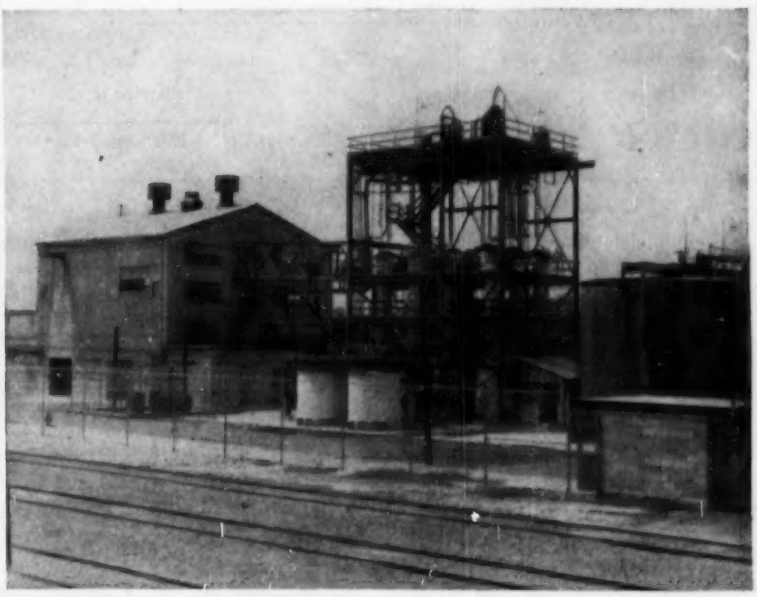
nylon from Chemstrand near Pensacola—are attracting largest investments in current industrial expansion projects that make . . .

industry has been built up on the high-grade phosphate rock deposits in Polk, Hillsborough, Hardee and Manatee counties—deposits that contain an estimated 19% of the world's phosphate total, and which are expected to support continued commercial production for something like 300 years. Mining and processing of phosphate have provided much of the raw material for the fertilizer factories that now polka-dot the state, furnishing plant nutrients tailor-made for Florida's wealth of citrus orchards.

Fast-Growing Timber: Another foundation for chemical processing in Florida: the state's millions of acres of pine trees, source of wood pulp and naval stores, and which can be replaced at a particularly rapid rate because of the climate—growing temperatures throughout the year, and annual rainfall averaging about 53 in.

Companies like Hercules Powder, Newport Industries and Glidden have been busy gleaning turpentine, rosin and other products from both trees and stumps via steam distillation. Pulp and paper mills have risen throughout the northern part of the state; expansion at these plants during the past two years totals nearly $100 million.

Sometime this summer, a new con-



national Minerals, and eight other principal producers—supply about two-thirds of country's needs, find sizable market right in state.

Story begins on p. 24

SUNSHINE STATE, 1954: Industry blooms all over.

cern will begin production in this field. Buckeye Cellulose Corp., a subsidiary of Procter & Gamble, is completing its $35-million plant at Foley, will turn out cellulose pulp for rayon.

And Now Synthetics: Also this year, Florida is becoming a major supplier of man-made fibers, with the $85-million Chemstrand plant near Pensacola already producing nylon in nine deniers and expected to start making its own nylon intermediates this fall.

The Chemstrand works—which will be a fully integrated nylon plant—illustrates several problems faced by chemical firms locating in Florida. Cooling water will be pumped from the nearby Escambia River, but water for process needs, boiler feed and drinking fountains will come from nine 1,000-gal./minute wells—Florida's surface waters are usually soft, but contain organic matter that makes them unsuitable for many industrial uses without treatment. Natural gas comes to Chemstrand through a six-mile branch pipeline—only the extreme northwest corner of the state has natural gas so far.

Citrus Chemicals: Whether processing of citrus fruit by-products can become a profitable endeavor for chemical concerns is still a matter for conjecture. The primary by-products —citrus pulp, citrus molasses and citrus peel oil—are already an important part of the fruit packing companies' operations, and some secondary by-products are established in commerce.

Since 1950, chemical companies have added some $70 million to their Florida investments. And along with the influx of industry, there's a steady immigration of people, assuring both an ample labor supply and an expanding home market. For the past 13 years, this immigration has been at the rate of more than 1,600 persons each week—substantial evidence that Florida's future will not be limited to tourism.

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CW-6

CIO'S McDONALD, BUCKMASTER: In new wage drive, they frown on strikes.

LABOR . . . . . .

Nickel May Click: Although David McDonald's CIO Steelworkers and L. S. Buckmaster's CIO Rubber Workers are opening the current drive for new wage rises with demands for "substantial" increases, there are signs that most unions this season will shy clear of strikes, settle for about five-cent boosts in base rates and a few cents more in fringe benefits. Reason why labor union leaders like McDonald and Buckmaster frown on strike action this year: they know that the Eisenhower Administration won't be eager to intervene in labor disputes, and they know that company inventories are high. Thus unions no longer can count on the White House to muster public sympathy, and many manufacturing companies have full warehouses that would enable them to withstand fairly long strikes.

Meanwhile, chemical companies are continuing to grant wage hikes that will keep chemical pay rates well above the all-manufacturing average. (Latest comparison: chemical, $1.86/hour; all-manufacturing, $1.79/hour.) Among recent increases at chemical plants:

• Local unions of United Gas, Coke & Chemical Workers (CIO), are in line for a 7¢/hour wage boost at American Cyanamid's Calco plant at Bound Brook, N.J.; a 3% increase (averaging about 6¢/hour) at Koppers Co. in Kobuta, Pa.; an 8½¢/hour rise at General Chemical Div. of Allied Chemical, River Rouge, Mich.; a 5¢ across-the-board increase at Union Carbide's Bakelite plant in Wyandotte, Mich.; a $2/week increase now and another $2/week rise next year under a new two-year contract for office workers at the Solvay Process Div. plant of Allied Chemical at Detroit.

• For locals of District 50, United Mine Workers of America, there's a 4% general increase at the Henry Bower Chemical plant at Philadelphia; a 5¢/hour boost at Morton Salt Co., Manistee, Mich.; and a 5% general pay hike at the General Chemical Div. of Allied Chemical at Claymont, Del.

•

New Local Unions: Bargaining elections conducted by the National Labor Relations Board at two small plants at Louisville, Ky., resulted in triumphs for AFL unions. The International Chemical Workers Union will represent about 35 employees at Cooperative Fertilizer Service of Richmond, Inc.; and the Glass Bottle Blowers Assn. will bargain for about 80 production workers at the Plax Corp.'s plastic container plant.

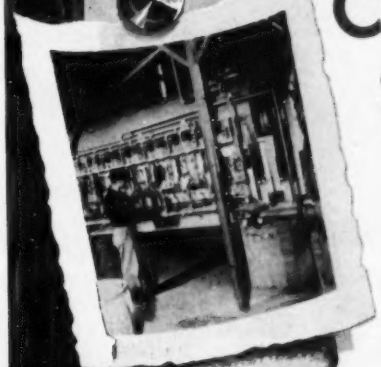
•

Segregation in Jobs: Some chemical labor union leaders are hoping that the recent Supreme Court decision against racial segregation in the public schools will—eventually—lead to less restricted hiring practices in industry. But in general, these unionists are expressing these hopes only in private conversations. They've been supporting the "fair employment practices" concept in principle; but now that this ideal appears to be approaching realization, the labor leaders are trying to keep from alienating members and prospective members who—in some plants—now feel secure from job competition on the part of non-whites.

Actually, hiring customs have been changing steadily, even in the Deep

· Davison Bulletin ·

CONFIDENTIAL CONFIDE



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South. A recent report by the National Planning Assn., Washington, analyzes job patterns in five locally owned and controlled manufacturing plants—two in Little Rock, three in New Orleans—and concludes that there have been "significant departures from traditional biracial employment practices." Much of the impetus for those changes, NPA finds, came from the need for additional employees at many Southern plants during World War II and since then.

•

Serene Summer: Only a few labor disputes clouded the chemical scene as summer rounded the corner.

• Signing of a new labor contract brought an end to the walkout that had shut down the Armour Fertilizer Works at Bartow, Fla., for two and a half days. About 250 employees were involved.

• What appeared to be a secondary boycott forced production to be halted at the Royster Guano Co.'s fertilizer plant at Toledo, O. Members of the AFL Teamsters union had been striking against Direct Transit Lines, Inc., a Grand Rapids (Mich.) trucking firm that hauls Royster's products. When Teamster pickets went to the fertilizer plant to discourage loading of Direct Transit trucks, President Joseph Williams of Local 68, United Gas, Coke & Chemical Workers (CIO), told his members to respect the Teamsters' picket lines. Gas-Coke represents the 115 Royster production workers.

LEGAL

Pin-pointing Problem: Cleveland's big sewer explosion last fall and the recent report on the need for tightening up on sewage disposal regulations (*CW, May 22, p. 30*) have been followed by 24 law suits that may set considerable precedent in pollution control litigation. The plaintiffs are suing Glidden, Shell Oil and Sun Oil for $1,715,000 as compensation for personal injuries and property losses sustained in the blast. Their petitions charge that those three companies—which all own manufacturing or processing plants near the site of the explosion—had been dumping flammable material into the city sewer system.

Dwight P. Joyce, president of Glidden, denies that his firm's operations contributed to the explosion. The only flammable liquids used by Glidden, Joyce says, are solvents, all of which are reclaimed.

Apparently based to some extent on information and theories recited in the report by three Case Institute professors, the petitions assert that

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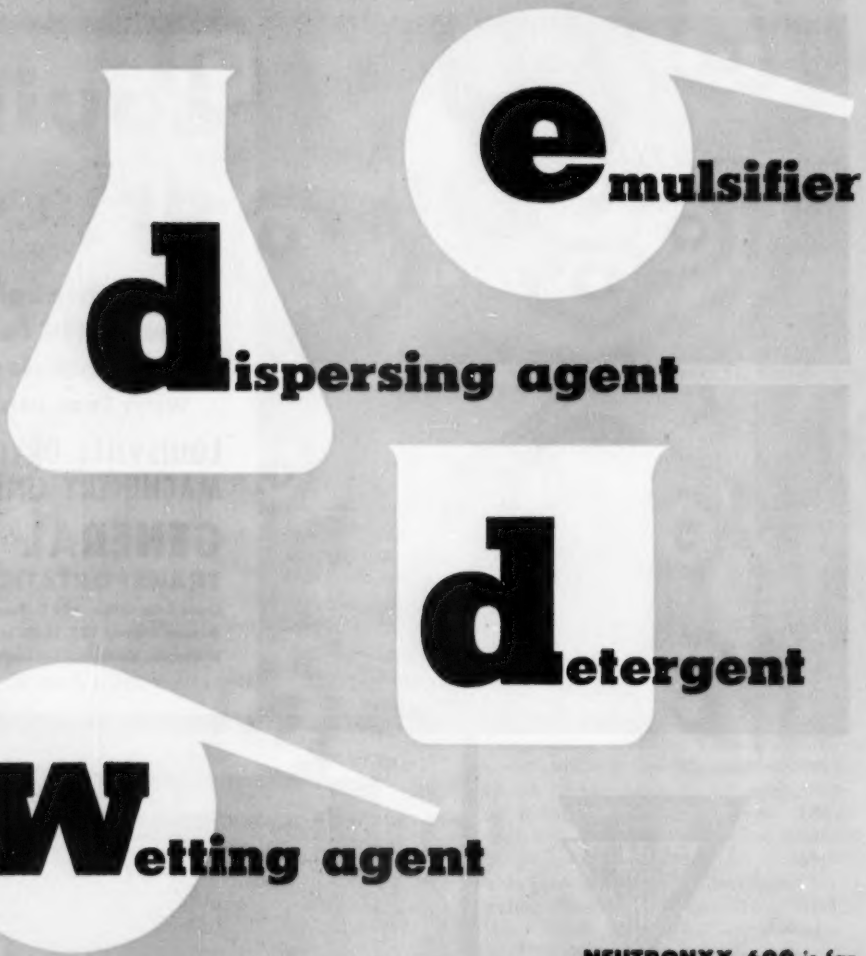

NEUTRONYX 600 is far superior to soaps, particularly on hard surfaces; is superior as an emulsifier in chlordane, DDT, emulsion paint, cosmetic and paste formulation; is remarkably efficient in mining, ceramic manufacturing, wall-paper removal and similar wetting operations; offers uniform, thorough dispersion of soaps in hard water, or with pigments of certain acids.

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WIDE WORLD

REP. CHURCH: After years of effort, triumph nears for foes of fireworks.

prior to the explosion, the sewer had become filled with explosive gas formed from flammable liquids that had leaked or been discharged from storage tanks on the defendant firms' property. Inasmuch as nearly 200 establishments along that sewer line had been using flammables, it would appear that the plaintiffs—in naming only three companies as defendants—will have the burden of pin-pointing responsibility for the blast when their cases come up for trial.

•

Damper on Fireworks: Congress now has passed, and President Eisenhower is expected to sign, the bill that's designed to prevent shipment of fireworks into states that have laws against use of pyrotechnics. This bill, introduced by Rep. Marguerite Stitt Church (R., Ill.) on the first day the present Congress was in session, provides fines of up to $1,000 and jail sentences of up to one year for a manufacturer or shipper convicted of violations. Nearly all states now have fireworks restrictions.

•

State Tax Tangles: Fairness and constitutionality of various state tax laws affecting chemical corporations are under question this week.

• In Baton Rouge, La., an Oklahoma company that operates interstate natural gas pipelines has filed suit attacking the constitutionality of Louisiana's gas gathering tax—a levy similar to the Texas tax recently declared unconstitutional by the U. S. Supreme Court. Petitioner is Louisiana Nevada Transit Co. of Ada, Okla., and it wants a refund on the $10,000 tax it paid during the first quarter of this

year (*CW Newsletter, May 15*). The Louisiana state legislature, now in session, is considering a move to amend the tax law to make it conform to the Supreme Court's ruling.

• Another plan to revise a state corporation tax before it's adjudicated in court is being considered in California. At present, a company with plants in California and in other states must pay a California state income tax based on proportions of its investment, sales volume and payroll in California to its nationwide investment, sales and payroll totals; and this is being criticized because it tends to discourage new, large investments in that state.

• Fairness and equity of the bauxite severance tax in Arkansas will be the subject of the July 9 meeting of the state legislative council. The council will decide whether to approve a proposal for an industry-financed study on that topic—to be conducted by a nonprofit research organization—for the guidance of the legislature, convening next year.

•

Segregation Again: Still denying that they have been violating the Sherman Act, U. S. Rubber and Dunlop Rubber Co. Ltd. are nevertheless taking the inexpensive way out by agreeing to a consent decree as basis for settlement of the five-year-old antitrust suit relating to those companies' international latex and foreign elastic thread business. The decree, filed in U. S. District Court, New York, parallels the judgment in the Du Pont-Imperial Chemical Industries antitrust suit in that certain jointly owned foreign subsidiaries are permitted to continue in operation, but must be under separate control of either U. S. Rubber or Dunlop. The foreign patent pool—which sells rights to some patents owned by these two concerns—will continue to operate, granting unrestricted licenses to foreign applicants.

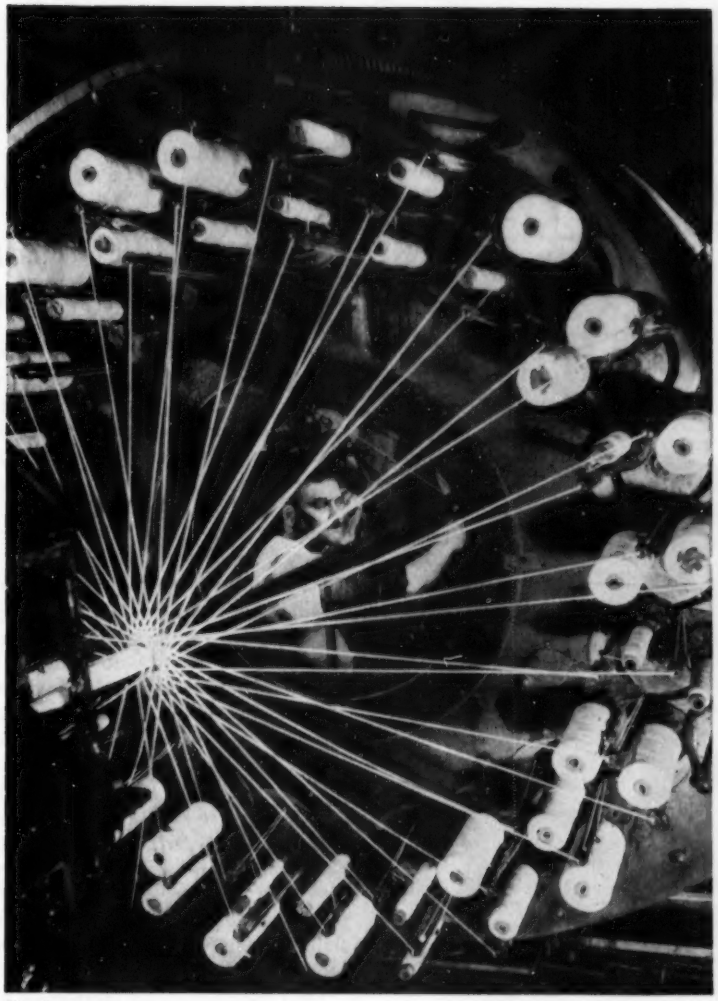
KEY CHANGES. . .

J. H. Humberstone, to president, Air Reduction Sales Co., New York.

Walter Murken, to production manager, Quaker Rubber Corp., division of H. K. Porter Co., Inc., Philadelphia.

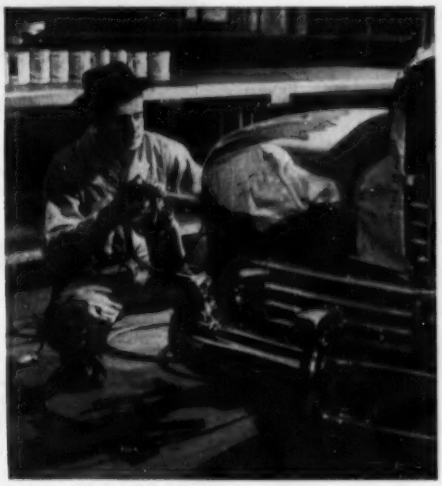
Reid W. Malcolm, Jr., to director of research and development, R. M. Hollingshead Corp., Philadelphia.

L. W. Reeves, to manager, chemical sales, and **George Hackim,** to manager, vinyl resin sales, Chemical Div., General Tire & Rubber Co., Akron, O.



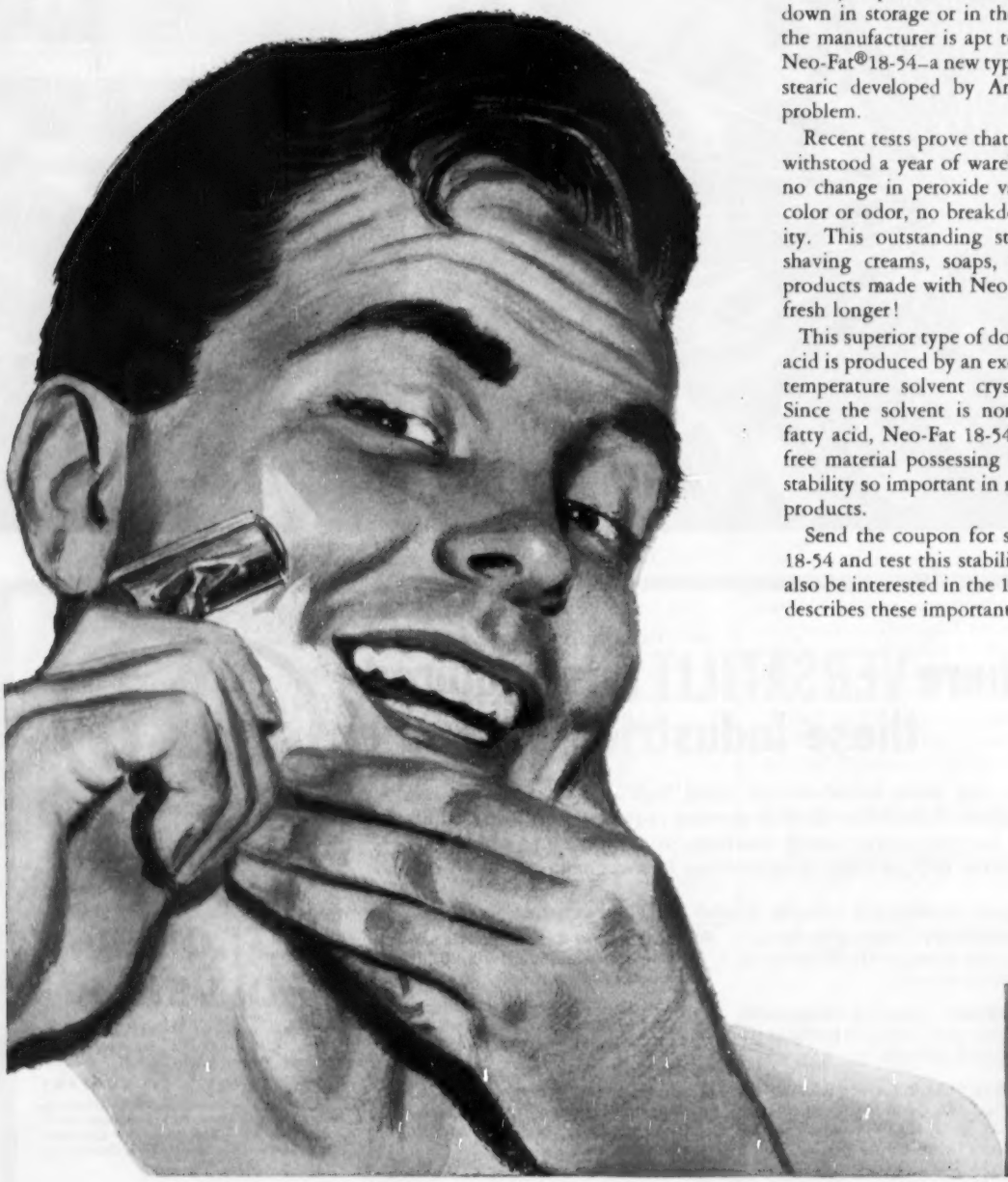
Fire hose

House paints



Automobile body lacquers

New products and profits with Armour Chemicals



Fatty acids for shaving creams still fresh after one year storage!

In using double pressed stearic acid to formulate shaving creams, soaps and cosmetics, freedom from yellowing and rancidity is extremely important. If the raw material breaks down in storage or in the finished product, the manufacturer is apt to take a large loss. Neo-Fat®18-54–a new type of double pressed stearic developed by Armour—solves that problem.

Recent tests prove that Neo-Fat 18-54 has withstood a year of warehouse storage with no change in peroxide value, no change of color or odor, no breakdown due to rancidity. This outstanding stability means that shaving creams, soaps, cosmetics, and all products made with Neo-Fat 18-54 will stay fresh longer!

This superior type of double pressed stearic acid is produced by an exclusive Armour low temperature solvent crystallization process. Since the solvent is non-reactive with the fatty acid, Neo-Fat 18-54 becomes an ester-free material possessing the color and heat stability so important in manufacturing your products.

Send the coupon for samples of Neo-Fat 18-54 and test this stability yourself! You'll also be interested in the 18-54 booklet which describes these important stability tests.

1% of Armid® O makes wax paper coatings transparent and flexible!

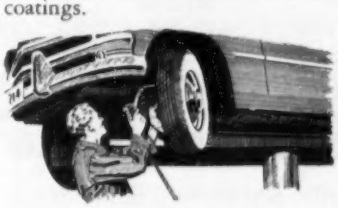
Many surface coating problems are solved with a combination of plastic and wax. But today's plastics are incompatible with the cheaper and more plentiful waxes. That's when an economical mutual solvent is called on to do the job.

For example, in the wet waxing of paper it is desirable to include modifiers that will improve the flexibility and transparency of the wax coating. Manufacturers have found that only 1% of Armid O, one of Armour's new high melting organic chemicals, will do this job well!

Armid O acts as a mutual solvent for the primary ingredients of quality wax paper coatings. The wetting property of Armid O improves the transparency of the coating by allowing better penetration of the wax into the paper fibers. A better bond of the coating to the paper is obtained and more flexibility at lower temperatures.

Send the coupon for the Armids Booklet and samples of Armid O. You'll find it effective in protective films, dye solubilizing, and fusible coatings.

Neo-Fat 65 increases output of lubricating grease!



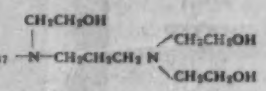
Manufacturers of lubricating grease for automobiles have found an Armour raw material which helps them produce more high quality grease at no extra cost! It's Neo-Fat 65, a double distilled animal fatty acid.

Neo-Fat 65 is produced by the most modern methods, closely controlled to meet rigid specifications, assuring uniform composition. 95 pounds of Neo-Fat 65 can be substituted for 100 pounds of neutral fat to obtain the same yield! And at least two batches of soap made with Neo-Fat 65 can be run in the time required for one using glycerides! For these reasons, manufacturers can expand grease production without buying new equipment or expanding their plants. Send for samples of Neo-Fat 65—another example of new profits with Armour Chemicals.

Ethoduomeen T/13 exhibits anti-corrosion properties

Oils containing the ethylene oxide addition product of a diamine form exceptionally tenacious films on metal. Using this new chemical on metal equipment will prevent the powerful corrosive action of sour crude oil, for example. The savings of thousands of dollars spent and man-hours lost in replacing equipment will mean more profits and more production to the producer.

Armour has enhanced the surface active characteristics of the fatty diamine, Duomeen® T, by adding ethylene oxide to the molecules. The structural formula is as follows:



N-Octadecyl N, N', N' tris 2-hydroxyethyl 1, 3 trimethylene diamine.

Since it contains two tertiary amine groups, Ethoduomeen T/13 can be readily quaternized. It is a free base and will react with organic and inorganic acids to form salts. Ethoduomeen T/13 and its salts have exceptional properties with applications in many industries. Send for samples today—test Ethoduomeen T/13 yourself!

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☐ Armid O Sample
☐ Ethoduomeen T/13 Sample

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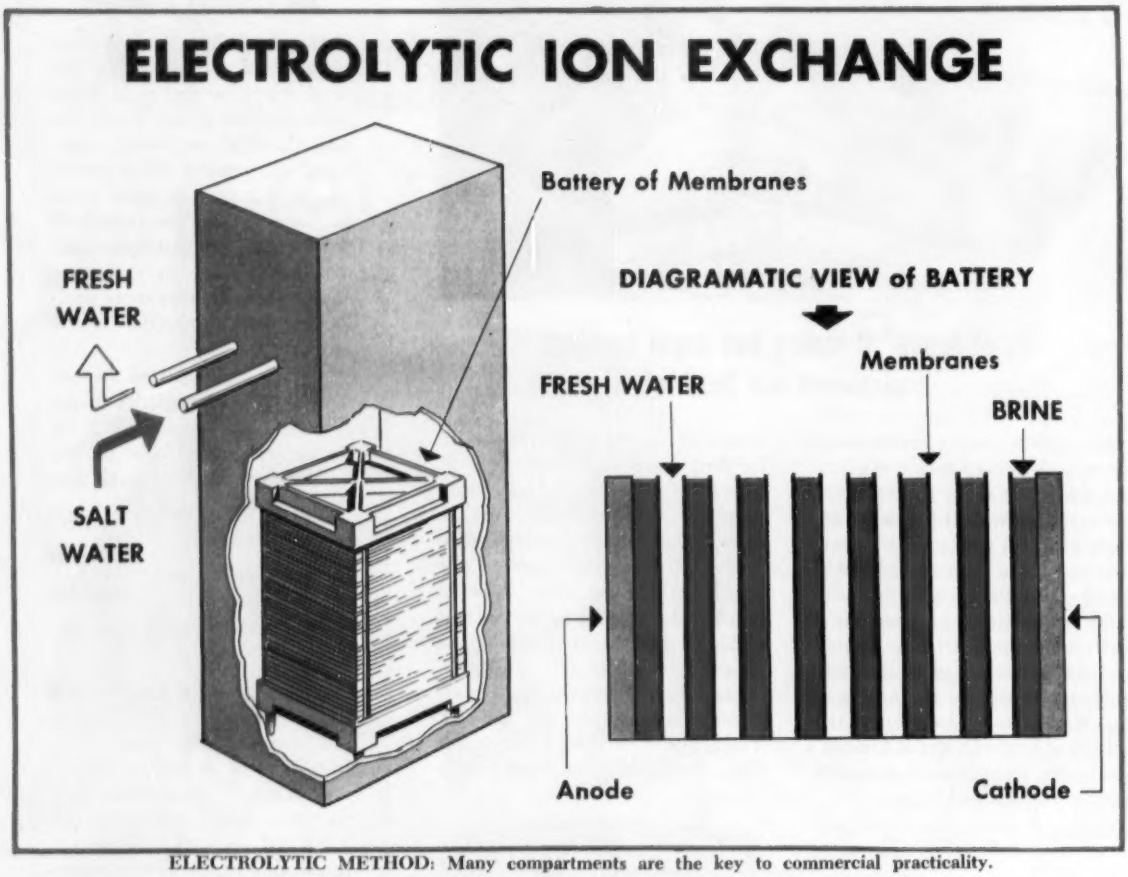


ELECTROLYTIC METHOD: Many compartments are the key to commercial practicality.

Hunting for Bargains in the Brine

From all directions, companies are zeroing in on an old target: fresh water from the sea.

The impact on chemical processing companies is two-fold: They're doing the work and they could reap the rewards of a more plentiful supply of water for their thirsty plants.

Here's what's happening:

In Cambridge, Mass., this week, Ionics, Inc., is rushing an unusual job toward completion: it's tailoring one of its electrolytic ion exchange units to fit a 32-ft. highway trailer. Literally just around the corner from Ionics, Badger Manufacturing is hard at work trying to scale up a laboratory model of a vapor-compression evaporator. And in Chicago, Bjorksten Research Laboratories is busily investigating different plastics as materials of construction for a solar evaporator. From three widely different directions, the three are focusing on a single target: a method of getting fresh water from the sea at a reasonable cost.

Those three, of course, represent only a small portion of a large field feverishly developing similar processes. For instance, although Ionics has received the biggest share of the news on the basis of its work on electrolytic ion exchange methods, Rohm & Haas, in cooperation with Hooker Electrochemical, has been quietly working along similar lines. And though it isn't under contract with the government, it is sharing its results with the Interior Dept.

In any case, the electrolytic ion exchange process looms as one of the two or three considered most likely to succeed in getting fresh water from marine or slightly saline water at a cost where it might compete with other sources of supply. This is how it works:

The basic unit is a cell made up of an anode and a cathode and divided into three compartments by two membranes, one of which is permeable only to cations, the other only to anions. Salt is fed into the cell and current passed through. When the current starts to flow, the sodium ions start to migrate toward the cathode while the chlorine ions go toward the anode. They either deposit on the electrodes or collect on the membranes. Thus, the vacating ions leave fresh water in the center compartment and brine concentrates in the outer two.

But because one coulomb of electricity would transport only one mole equivalent of salt in the simple system, the three-compartment cell is highly inefficient. So the accepted practice is to employ many membranes, thereby forming a whole series of alternating

fresh water and brine compartments.

When Ionics unveiled its cost estimates two years ago, most experts felt they were obtained on a slide rule, were based more on optimism than reality. But in the time since, Ionics engineers have been straining their talents to keep their slide rules honest. And though they haven't achieved their goal, they have made headway. They have, for instance:

- Installed a 15-gal./hour unit for the Navy at Woods Hole, Mass. It's been operating continuously, unattended, for over 3,000 hours.
- Started to build the 80-gal./min. mobile unit for the trailer. Scheduled for delivery on Oct. 7, the unit will start test runs in the Southwest to make brackish water suitable for irrigation. A similar unit is due to start up in July in the Midwest or Southwest to make brackish water potable.
- Recently reported that they're ready to build units ranging in capacity from 2,500 to 200,000 gal. of fresh water daily. For the bigger units, they figure the initial cost will run from about $1.50/gal./day of capacity (for removing 90% of the mineral content of the water) to 75¢/gal./day of capacity (for units that remove only 67% of the mineral content). Electricity requirements, they say, should be between 0.4-0.5 kwh./lb. of mineral removed. At the same time, the firm makes it plain that those cost figures are based on present production, don't, by a long shot, represent what can ultimately be achieved.
- Built two units and are building another for operation outside the country.
- Continued to push forward on other applications for the units. The firm now says it's "very close" to building a pilot plant for a sugar mill.

At present, Ionics doesn't make any claims that its units have any edge costwise on some competing processes of getting fresh water from the sea. It is quick to point out, however, that costs for its electrolytic process—unlike those for evaporative equipment—vary in direct proportion to the amount of solid being removed from the water. Thus, it feels, it is way out in front when it comes to treating brackish or slightly saline water.

It also feels that its years of development work have given it know-how that's impossible to duplicate, and is understandably loath to discuss some of the details of the units. For instance, the firm has received a patent (U.S.P. 2,636,851) on a method of making a membrane from ion-exchange resins and another (U.S.P. 2,636,852) of employing the membrane in multiple cells, but won't say whether or not it actually uses ion-exchange materials. Nor will it discuss the nature of the electrodes or the number of membranes it's able to fit into a given unit.

Closing the Gap: But while Ionics has been making progress, the rest of the field has not been dragging its feet. Rated about on a par with the electrolytic method is the vapor-compression process. This method is based on the heat-pump principle. In it, vapor is withdrawn from an evaporator shell by a pump, compressed to raise its condensation temperature a few degrees, then returned to a heat exchanger inside the evaporator shell. There, it gives up its latent heat to evaporate more salt water.

Badger Manufacturing has, like Ionics, snared a contract with the Interior Dept. for the latter's saline water conversion program (*CW, April 24, p. 11*). The firm has introduced a new wrinkle by creating turbulence in the water at its boiling point, thereby cutting the energy requirements for producing steam.

This could reduce the costs of the whole process considerably (*see box, p. 39*). But, as Badger is the first to admit, the idea has been proved on a

PROCESSES IN THE RUNNING

At the present stage of technological development, six processes loom as the most likely means of getting fresh water from the sea at a reasonable cost. Here are the best available cost estimates for the six, based on a 75 million gal./day plant:

Electrolytic ion exchange: Present lab-scale equipment indicates salt water can be converted into fresh water for $1.25-1.50/1,000 gal. However, costs for brackish water are considerably less. For instance, water containing 10,000 ppm. of dissolved solids might be converted into fresh water for $0.125/1,000 gal. and 885-hpm. water for $0.0125.

Vapor-compression evaporation: Currently developed equipment can probably produce fresh water from sea water for $1.25-1.50/1,000 gal. Equipment now in the lab indicates these figures might be halved.

Temperature-difference evaporation: At some locations where the temperature of the surface water varies by as much as 17 F from the water underneath, a small-scale unit might produce fresh water at a cost of $0.70-0.80/1,000 gal.

Solar evaporation: The government feels that cost for this method would be about $2/1,000 gal. But M.I.T.'s Maria Telkes and the University of California's E. D. Howe have estimated costs could be as low as $1.10/1,000 gal.; and under ideal conditions, that figure could be cut by two-thirds.

High-temperature, high-pressure methods: Nuclear Development Associates figures that by the use of temperatures near 700 F and pressures of 3,200 psi., it can make fresh water from the sea at a cost of $0.30-0.80/1,000 gal. Scale-up of such a process would be difficult; finding the right materials of construction to withstand corros.on under those conditions could be a chemical engineering nightmare.

Multiple-effect evaporation: Most experts have felt that costs for this process would be at least $3-4/1,000 gal. One operator has estimated, however, that it can be done for as little as $1.50-2/1,000 gal.

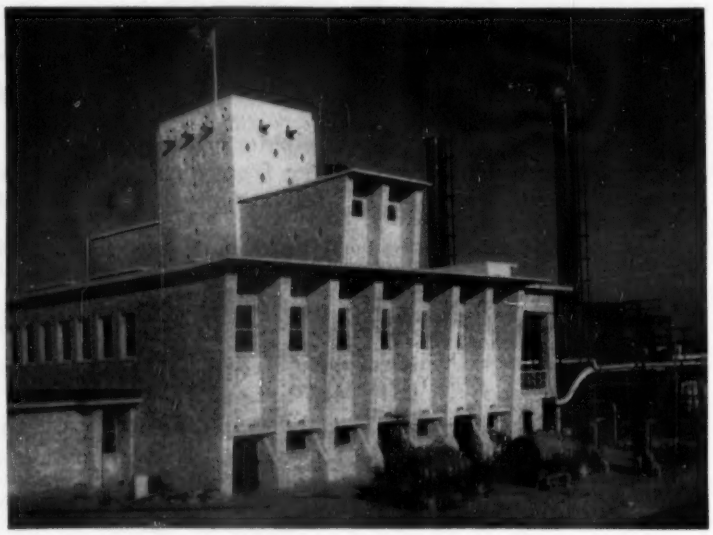
small scale only. And though there is no obvious reason why it can't be scaled up, Badger is very cautious on the subject. It says that it doesn't know yet whether the figures can be proved; in fact, it isn't at all sure that the method will work on bigger equipment.

Meanwhile, the Corps of Engineers has made what could be a significant contribution to the technology of vapor-compression equipment. One of the drawbacks of these systems has been the build-up of scale, which lowers the efficiency and raises the costs. Engineers at the Army Engineer Research and Development Laboratory (Ft. Belvoir, Va.) found that equipment can be descaled simply by the addition of citric acid and that the use of the acid would permit "indefinite maintenance of production by field units."

On All Sides: But though the electrolytic ion-exchange and vapor-compression methods look promising, there are four other processes that are considered good bets, another half-dozen that loom as distinct possibilities. Here's the run-down:

• Multiple-effect evaporation. The familiar chemical engineering technique is being used in such places as Kuwait (*see cut, below*) to convert sea water into fresh. Its cost are apparently too high to warrant serious consideration in this country. In general, it requires larger physical equipment and is less efficient than vapor-compression distillation.

• Thermal-difference evaporation. The idea of making use of the large temperature difference between surface and deep ocean waters originated with Claude in 1930. An attempt to exploit this idea in a plant in Cuba failed because of difficulty with the deep-water pipeline. University of California scientists have, however, taken over where the Cuban effort left off. They have built a small unit in which the warm sea water is pumped into an evaporator maintained under reduced pressure. Some of the water evaporates, gaining its latent heat through a 5 F cooling of the rest of the water. The vapor passes through a turbine, which operates a generator, then condenses in a vessel whose pressure is lower than that of the original evaporator. It's condensed by the cooler sea water. The French are building a similar plant at Abidjan on the coast of French West Africa. A



Sea-Water Conversion

THIS WATER distillation plant at Kuwait, in the Persian Gulf, converts sea water into a million gallons of fresh water daily. It's a multiple-effect evaporator—the latent heat of the water vapor from one effect is used to supply heat for the next. The Kuwait plant, world's largest, supplies water for a petroleum refinery. Costs for a similar unit in the U.S. for such a purpose, would be prohibitive.

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100,000-gal./day unit could probably produce slightly more power than needed to operate the pumps of the system.

• Solar evaporation. The sun, of course, is always evaporating water; then the atmosphere releases it later in the form of rain. Unfortunately, the rain doesn't always fall where its wanted. The idea is to harness the sun's energy at a given spot. The principle was put to work in life-raft kits during World War II, and a solar evaporation unit was built in Chile toward the end of the last century.

Since the method involves no costs for fuel, the only way to reduce costs is in the equipment itself. That's why Bjorksten is working on plastic apparatus. It's unlikely that this method will become economically attractive, however, until other fuel costs rise appreciably.

• High-temperature high-pressure distillation. The Nuclear Development Associates proposal looks good on paper, but corrosion could be an almost insurmountable problem (*see box, p. 39*). Titanium, however, might be the answer to it.

• Freezing out water. The basis for this idea is that the latent heat of fusion for water is only one-seventh of its latent heat of evaporation. The catch is that this difference disappears if the heat is recovered anyway, as it is in the evaporative methods. Problems with the method is that when operating at low temperatures, efficient heat transfer is more difficult and expensive, and frozen ice crystals entrap saline water to make separation difficult. This latter handicap might be overcome through centrifugation.

• Ion-exchange methods. Ion exchange has been successfully used in demineralizing water. But the units must be regenerated periodically. When dealing with water that has a heavy mineral content, the cost of the regenerants is prohibitive. Furthermore, some of the fresh water produced must be re-employed in the regeneration.

• Osmostic methods. It would be possible to employ a semipermeable membrane to separate fresh water from a saline supply. A variation of this would be to use a molecular oil film as the membrane. At present, there's little known about the commercial feasibility of either method.

• Solvent extraction and adsorption. Similarly, it's possible to take up fresh water from a salt solution by a solvent, which must then be capable of giving up the water by a small alteration of temperature. A group of alkylarylamines and alkyl-substituted arylamines gives indication of doing

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that. Conceivably, it might also be possible to find a material that would adsorb the fresh water then release it upon heating.

• Electrogravitation. Another possibility is the use of an electric current to concentrate minerals in one place. That portion of the water would be denser and the purer water would rise to the top.

Setting the Sights: Purists divide the methods of getting fresh water from a salt solution into two categories: those that remove water from the solution and those that remove salt from the solution. But when sea water is involved, the thermodynamics of the problem are the same.*

And thermodynamics prove that it takes 2.6 kwh./1,000 gal. of water to separate the first batch of fresh water from an infinite quantity of sea water containing 35,000 ppm. of dissolved solids. To separate half the water requires approximately 3.6 kwh./1,000 gal. and to completely separate the water and salt takes about 9 kwh./1,000 gal.

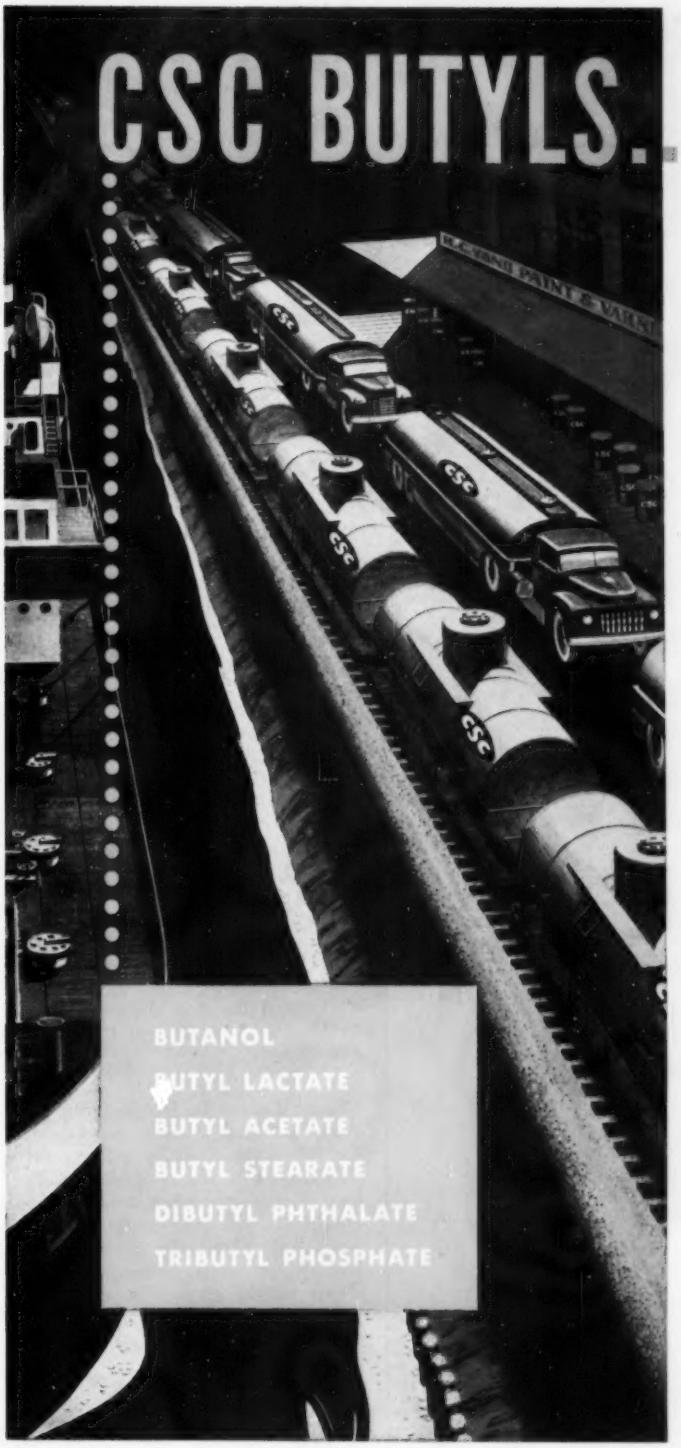
It would seem more attractive, then, to use a lot of sea water to get a relatively small amount of fresh water. But that means that the size of equipment gets out of hand; consequently a compromise must be reached. Plants employing vapor-compression equipment probably hit optimum efficiency when they separate about 80% of the water.

Also from a strictly practical standpoint, the energy losses in even the most efficient systems amount to many times the theoretical minimum of 2.6 kwh./1,000 gal. And since these losses are practically independent of the salt concentration, it makes little difference whether the water being treated contains a high or low concentration of salts.

Processes that separate the salt from the water (e.g., ion exchange or electrolytic ion-exchange methods), on the other hand, don't suffer such heavy losses when the salt concentration is small. Hence their big advantage in treating brackish water.

Some of the costs being bandied about for the various processes could well make them attractive for some areas right now. It is also probable that improvements in technology will help to bring the costs even lower. But event the most efficient plant, everyone agrees, could never take the place of a clean, plentiful supply of fresh water.

* As pointed out by James De Haven, Linn Gore and Jack Hirshleifer in their report for the Rand Corp., "A Brief Survey of the Technology and Economics of Water Supply."



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PRODUCTION . . . .

EQUIPMENT

Airless Cleaner: American Wheelbrator & Equipment Corp. (Mishawaka, Ind.) is out with a new airless blasting machine for cleaning 30- and 50-gal. drums. Aimed as an aid to reconditioning operations, the machine will clean the exterior of closed-end drums, the interior and exterior of open-end drums. The system is arranged in two stations so that while one station is working, the other can be unloaded, thus assuring continuous operation.

•

Heavy Plates in Stock: By-Products Steel Co., a division of Lukens Steel (Coatesville, Pa.), claims a unique service for fabricators and designers: it now has a comprehensive warehouse stock of heavy plates, ranging from ½ in. to 15 in. thick. As the firm sees it, this permits customers to shift their warehouse and inventory problems back on the supplier.

PROCESSES . . . .

Going Strong: The much-heralded leach process of making nickel (*CW, March 17, '52, p. 43*) is now in and running at the Fort Saskatchewan (Alberta) refinery of Sherritt Gordon Mines Ltd. Eldon Brown, president of the firm, told stockholders late last month that the first units of the $24-million refinery had been operating for two weeks, and had been working in excess of design capacity. The plant was designed and developed by the Chemical Construction Corp. (New York City), employs the process jointly developed by Sherritt Gordon and Chemico.

•

Closing Down: In Binghamton, N.Y., Ansco decided to close down one of the production units in its film coating department for about six months. Reasons given: current general business conditions, a drop in government business. But taking the optimistic outlook, Ansco noted the temporary shutdown would give it a chance "to improve our competitive position by working on our long-range modernization program."

•

Contract Awarded: Stone & Webster Engineering Corp. (Boston) last week received the nod from the Atomic Energy Commission to perform architect-engineering services connected with the design of the pressurized water reactor project to be built near Shippingport, Pa. The New England firm will act as subcontractor to Westinghouse, prime contractor for the nuclear portion of the project.

DEWEY & ALMY — DISPERSING AGENTS

DAXAD 11

composed of polymerized sodium salts of alkyl naphthalene sulfonic acids. DAXAD 11 is an effective dispersant for carbon black, pigments, insoluble dyes, and other small particle solids in aqueous media. In ball and pebble mills, DAXAD 11 breaks down agglomerates generating improved grinding action with less power. Rubber manufacturers and other concerns dealing with polymerization techniques find DAXAD 11 of great value.

Specifications

Color	Buff	Surface Tension –dynes/cm. (1% soln. at 72°F.)	70-71
Active Dispersing Agent % wt., min.	77	pH (1% soln. at 72°F.)	8.0-10.5
Moisture Content % wt., max.	8		

DAXAD 11KLS

composed of polymerized potassium salts of alkyl naphthalene sulfonic acids. DAXAD 11KLS is designed for use in latex paints. Being the potassium salt and containing a very small percentage of sulfate, DAXAD 11KLS can be used in latex paints with minimum introduction of the components which bring about efflorescence.

Color	Light Buff	Sulfate Content (as K_2SO_4), %	7-10
Active Dispersing Agent % wt., min.	85	Sodium Content %, max.	0.25
Moisture Content % wt., max.	5	pH (1% soln. at 72°F.)	7.0-8.5

DAXAD 12K

a water solution of potassium salt which is used by synthetic rubber manufacturers for cold process.

Total Solids, %	40 ± 1

DAXAD 21

a dry, water-soluble dispersing agent composed of the mono and di calcium salts of polymerized aryl alkyl sulfonic acids. DAXAD 21 is a brown powder recommended for dispersing finely divided insoluble materials in water. DAXAD 21 is stable in the presence of mild acids and alkalies. The maximum recommended concentration of a solution at 70° F. is 25%. Not recommended for use in presence of soaps or calcium salts.

Color	Brown	Surface Tension –dynes/cm. (1% soln. at 72°F.)	60-65
Active Dispersing Agent % wt., min.	75	pH (1% soln. at 72° F.)	7.0-8.5
Moisture Content % wt., max.	20		

DAXAD 23

a particularly useful dispersing agent consisting of polymerized sodium salts of substituted benzoid alkyl sulfonic acids. DAXAD 23 is a powder, stable in the presence of mild acids and alkalies. DAXAD 23 is used extensively in effecting pigment dispersions which exhibit better color and less tendency toward settling.

Color	Dark Brown	Surface Tension –dynes/cm. (1% soln. at 72°F.)	56-57
Active Dispersing Agent % wt., min.	85	pH (1% soln. at 72°F.)	7.0-8.5
Moisture Content % wt., max.	10		

DAXAD 27

composed of polymerized sodium salts of substituted benzoid alkyl sulfonic acids combined with an inert inorganic suspending agent. DAXAD 27 is particularly useful in obtaining longer lasting suspensions of larger size particles.

Color	Light Gray-Brown	Surface Tension –dynes/cm. (1% soln. at 72°F.)	62-65
Active Dispersing Agent plus Suspending Agent % wt., min.	88	pH (30% suspension in water)	6.0-8.0
Moisture Content % wt., max.	12		

DEWEY & ALMY — POLYVINYL ACETATE EMULSIONS

DAREX X52L

a standard low molecular weight polyvinyl acetate emulsion characterized by quick adhesion, fine particle size, and low viscosity. DAREX X52L gives a film of high tensile strength which finds wide application in textiles, surface coatings, paints, adhesives.

Properties

Total Solids, %	54-56
Viscosity, cps.	300-600
Odor	None

DAREX X56L

a high molecular weight polyvinyl acetate emulsion which is characterized by excellent adhesion, a fine particle size, low viscosity, and fast drying. It gives a film which has a high blocking temperature. DAREX X56L finds wide application in adhesives, oil resistant primer sealers and textile and leather finishes.

Total Solids, %	54-56
Viscosity, cps.	300-600
Odor	Slight (monomer)

DAREX Polymer Y

a colloidal, water solution of a modified polyvinyl acetate. Polymer Y is supplied in neutral solution as a translucent, semi-viscous fluid miscible with water in all proportions. The most amazing property of Polymer Y is the high water resistance of cured films, even when air dried. Polymer Y yields clear, glossy, hard films used as coating materials and as binders in coating compounds.

Total Solids, %	38-40
Viscosity, cps.	100-300
Odor	Slight

DEWEY & ALMY — EVERFLEX EMULSIONS

DAREX Everflex A

the first of a series of new vinyl acetate copolymer emulsions with unique new properties and compatibilities. Their films are marked by an inherent softness and flexibility usually found only in synthetic rubber type latices. Because this flexibility is independent of the presence of a separate plasticizer, Everflex films cannot become embrittled by plasticizer loss due to evaporation, migration, or extraction. The Everflex series is closely related to polyvinyl acetate emulsions, possessing similar qualities of chemical stability, permanent clarity, freedom from yellowing, non-oxidizing, and non-aging. Everflex A dries to a firm, tough film with applications in the fields of coatings, textile sizes, and adhesives.

Emulsion Properites	
Total Solids, %	54-56
Viscosity, cps.	1000-1200
pH	4.0-6.5
Film Properties	
Tensile Strength (lbs/in.²)	2000-2200
Color	Water-White
Light Stability	Excellent
Aging	Excellent
Gloss	High
Melting Range	Above 390°F

DAREX Everflex B

this new vinyl acetate copolymer emulsion produces an internally plasticized film which is softer and more flexible than Everflex A, but is otherwise similar in properties. Everflex B will be of interest where a more flexible film or a softer hand is required than can be obtained with Everflex A.

Emulsion Properties	
Total Solids, %	54-56
Viscosity, cps.	1000-1200
pH	4.0-6.5

Film Properties	
Tensile Strength (lbs/in.²)	1000-1300
Color	Water-White
Light Stability	Excellent
Aging	Excellent
Gloss	High
Melting Range	Above 390°F

DAREX Everflex G

here is a new vinyl acetate copolymer emulsion that is specially designed as a vehicle for water-based paints. Everflex G exhibits superior water resistance, good pigment wetting properties, and excellent film formation even at low temperatures. Like the others in this series, internally plasticized Everflex G is non-aging, non-discoloring, and permanently flexible. Its use is suggested for primers, interior finishes, and exterior masonry paints. It is being actively investigated in exterior wood finishes, and early indications are most promising.

Emulsion Properties	
Total Solids, %	50-52
Viscosity, cps.	300-500
pH	4.0-6.5
Film Properties	
Tensile Strength (lbs/in.²)	2000-2200
Color	Water-White
Light Stability	Excellent
Aging	Excellent
Gloss	High
Melting Range	Above 390°F

DEWEY & ALMY — HIGH STYRENE COPOLYMER LATICES

DAREX 610L

an extremely fine particle size film-forming latex. DAREX 610L contains anti-oxidant which enables the casting of non-discoloring films. 610L is widely accepted in the paper industry where it is utilized by both manufacturers and converters for sizing and coating applications.

Properties	
Total Solids, %	45.0 ± 1
Particle Size, microns	90% below 0.15
pH of Latex	10-11

DAREX 616L

a medium particle size, very high styrene copolymer which forms a hard, brittle and transparent resin when dried. DAREX 616L is specially adapted for impregnating textiles and other fibrous materials. Examples: Hard box toes for shoes, backings for rugs.

Properties	
Total Solids, %	50 ± 1
pH of Latex	10-11

DAREX 3L

an extremely nervy, high styrene (approximately 71%) copolymer which is film-forming. DAREX 3L possesses very high water resistance, flexibility, tensile strength, elongation, and tear resistance. 3L is applicable for use in leather finishes, adhesives, textile sizes, and impregnating oil resistant felt packings.

Latex Properties	
Total Solids, approx. %	45
pH	9.0
Film Properties	
Styrene Content, %	71
Appearance	Water-White Transparent

DAREX X34L

a very high styrene (85%) copolymer which forms a hard, brittle, and transparent resin. DAREX X34L is widely used in the carpet industry in the formulation of rug backings. Further, DAREX X34L is used in leather finishes and dressings, and in adhesives.

Properties	
Total Solids, approx., %	45
pH	9.0

DEWEY & ALMY — HIGH STYRENE COPOLYMER RESINS

DAREX 3

a specialty copolymer of approximately 70% styrene and 30% butadiene with excellent electrical properties and water resistance. It can be vulcanized in rubber compounds. DAREX 3 improves impact resistance of polystyrene, abrasion resistance and hardness of rubber sport ball covers, and electrical properties of rubber wire.

Properties

Tensile Strength (psi)	1590	Impact Strength (Izod), ft. lbs./in. of notch	10+
Elongation, %	390	Dielectric Const. (1-1000 K.C.)	2.4-2.6
Hardness (Shore A)	87	Power Factor % (1-1000 K.C.)	0.2-0.5
Sp. Gr.	1.01		

DAREX X34

a light amber colored resin containing approximately 85% styrene which is specially modified for high impact strength and heat resistance. DAREX X34 is used in special purpose wire and cable manufacture. Can be used for injection molding to give a semi-flexible high impact molding.

Tensile Strength (psi)	4820	Impact Strength (Izod), ft. lbs./in. of notch	5.0
Elongation,%	18	Dielectric Const. (1-1000-K.C.)	2.4-2.6
Hardness (Shore A)	Over 100	Power Factor, % (1-1000 K.C.)	0.2-0.5
Sp. Gr.	1.04		

DAREX 43G

a white resin marketed in granular form. DAREX 43G has properties which make it much sought after in the manufacture of synthetic shoe soles and floor tiles. DAREX 43G finds its application in reinforcing natural and synthetic rubbers where stiffness, hardness, and high abrasion resistance, with low specific gravity, are required. It is particularly suited to light colored or white compounds where a non-staining, non-marking compounding agent is required. Typical applications are shoe soles, floor tiles, and rubber household articles.

Tensile Strength (psi)	7700	Dielectric Const. (1-1000-K.C.)	2.4-2.6
Elongation, %	2	Power Factor % (1-1000 K.C.)	0.2-0.5
Hardness (Shore D)	Over 80		
Sp. Gr.	1.04		

DEWEY & ALMY — PLASTICIZERS

DAREX Di butyl Phthalate

a colorless liquid, soluble in many common organic solvents, highly compatible with most resins, used to plasticize nitrocellulose lacquer formulations. Further, DBP is an active solvent for nitrocellulose and has a high petroleum naptha dilution ratio. Mixtures of DBP and castor oil yield low volatility and low temperature flexibility in most lacquer formulations.

Specifications

Sp. Gr. 25/25°C	1.045±0.001
Color APHA, max.	50
Moisture, % max.	0.1
Acidity (calc. as % phthalic acid), % max.	0.01
Ester Content, % min.	98

DAREX Di iso octyl Phthalate

one of the most stable plasticizers available for polyvinyl resins. DAREX DIOP has a minimum tendency towards migration. It gives vinyl films permanent flexibility and high tensile strength, and the excellent electricals place DAREX DIOP in a superior position for plasticizing vinyl insulation.

Sp. Gr. 20/20°C	0.986±0.002
Color APHA, max.	50
Moisture, % max.	0.1
Acidity (calc. as % phthalic acid), % max.	0.01
Ester Content, % min.	98

DAREX Di octyl Phthalate

di-2-ethyl hexyl phthalate is comparable to DAREX DIOP and may be used interchangeably in plasticizing polyvinyl resins. DAREX DOP, however, yields slightly higher dispersion viscosities and is slightly more volatile than DIOP. DAREX DOP also finds application in softening nearly all types of synthetic rubbers.

Sp. Gr. 25/25°C	0.983±0.002
Color APHA, max.	50
Moisture, % max.	0.1
Acidity (calc. as % phthalic acid), % max.	0.01
Ester Content % min.	98

DAREX Di butyl Maleate

DAREX DBM can be interpolymerized or copolymerized with vinyl acetate, vinyl chloride, or styrene, to form transparent resins with excellent aging and optical properties. Copolymers of DAREX DBM and vinyl chloride possess good electrical insulation properties.

Sp. Gr. 25/25°C	0.989±0.005
Color APHA, max.	50
Moisture, % max.	0.1
Acidity (calc. as % acetic acid), % max.	0.03
Ester Content, % min.	98

DAREX Di iso butyl Adipate

an excellent plasticizer for vinyl-vinylidene copolymers which possesses good low temperature properties. Because of its low toxicity and odor level, DAREX DIBA is designed specifically for use in food packaging.

Specifications

Sp. Gr. 25/25°C	0.950±0.005
Color APHA, max.	50
Moisture, % min.	0.1
Acidity (calc. as % adipic acid), % max.	0.02
Ester Content, % min.	98

DEFENSE'S QUARLES: He's for a steady grip on the purse strings.

Leveling Off the Peaks

The fattest cat in the federal research household is in for some slimming down: budget limitations, staked out by Congress and the Administration, will trim Defense Dept. research and development spending by 10-15%.

That's the latest word from the Washington fiscal experts on the 1955 budget. Here's what it will mean to scores of companies with Defense Dept. R&D contracts.

Taking in about three-quarters of the total government research expenditure (which came to $2.12 billion in 1953), the Defense R&D outlay is an easy mark for the budget cutters. Much of the planned reduction will be the result of pruning of existing programs; and importance to the defense effort looks like the chief criterion.

Low-priority projects will be the first to suffer, but not to the advantage of more essential jobs: even where a project has a direct tie to weapons development (e.g., rocket propellants), it doesn't stand very much chance of a boosted allotment.

Moreover, the further away from its objective the project is, the greater is the probability of its having its funds pared.

On the receiving end of the economy ax, Defense Dept. is in much the same position as all other government agencies, with the conspicuous exception of the Agriculture Dept.*

Reasons for the over-all demise are clear-cut. There has been a retreat from the Korean peaks in R&D spending, when the U.S. tried to buy research time with money.

Second is a concerted effort to cut the fat out of all programs, cut the lag between planning for research and actual spending, and level outlay at a rate of around $1.2 billion/year. This is direct spending only, doesn't include maintenance and operation costs. Next year's pruned budget, if it gets through Congress, will achieve this figure.

And it will embody some significant changes in emphasis affecting the chemical field: R&D spending for chemical, biological and atomic warfare is going down $2 million from the present year's peak $63 million. However, money allotted to the Air Force's propulsion program, down during the current year from previous highs, is to increase 27% to $80 million. This is a prime example of efforts to concentrate money in projects that have foreseeable "punch."

No Surprise: Even so, one propellant contractor says: "We have two new developments that we think are hot. I can't see how they can refuse us the extra money we'll need to develop them—but still I won't be surprised if we have to go along at our present level."

Assistant Defense Secretary Donald Quarles feels that an over-all $1.2-billion level is the best balance among many factors. It maintains a level of defense research activities that attempts to establish a sound ratio between government-military research and civilian science, the total availability of research personnel and facilities, and the need for balancing the federal budget.

The $1.2-billion level is a step downward from the levels of the past few years, when many programs were "crashed"—i.e., pushed as fast as possible—but the rate is a rather considerable increase from the $550-million pre-Korea levels that on hindsight proved inadequate.

The more-than-doubling of research money was accompanied by overfunding of some projects to the point at which services had firmly committed their money three, four and five years in advance.

Because of this, top fiscal officials in the Defense Dept. imposed a spending limitation last year under which agencies were told not to exceed 75% of the total amount they requested from Congress.

But agencies were given hope that they might get the difference between this 75% and the amount finally appropriated for the fiscal year, if they (1) could show comptrollers that by getting this money they wouldn't automatically commit money from the 1955 budget; and (2) could again justify the projects as essential to their programs.

Assurance Wanted: Such re-evaluations, which, by and large, have forced agencies to commit their money only a year in advance, may have pruned some projects too much, but research administrators feel they can do their jobs, if they can get some assurance that such levels will be steady.

Secretary Quarles has been one of the strongest advocates of such a policy. "I am sure," he says, "there is at least a factor of two between the values per dollar you can get in a steady program as compared with one that has sharp ups and downs in it."

So it isn't hard to see why there was quite a shaking of heads in various research agencies when the House of Representatives cut an additional 5% on top of the 10% reduction. Quarles is afraid that the House vote is a pre-

* Whose estimated expenditure for 1955 is $76.4 million—$16.7 million over its 1954 estimated expenditure.

lude to the return of the old "peak and trough" system.

There are those who argue that the cuts made by the House will just lower such working capital reserves. Whether or not such an answer is valid, the services are asking the Senate in current appropriations hearings for the budgeted amount.

In view of the Senate's traditional restoration of many House cuts there's a good chance that the services will get some of their money back.

Olefinic Surprise

Bring out a brand-new, untried chemical and—if it isn't prohibitive in cost—someone will find a use for it. That brand of commercial chemical development philosophy is boosted this week by disclosure of the results of Standard Oil Co.'s (Indiana) research with Hooker Electrochemical's hexachlorocyclopentadiene.

Chemist Ellis Fields of Standard's Whiting (Ind.) laboratories has pioneered a new reaction of mono-olefins and hexachlorocyclopentadiene that is yielding a flock of commercially promising chemicals.

But Hooker hasn't been marking time with the chloro compound, waiting for others to develop applications; among other uses, the chemical is the key to the company's recently developed Hetron resin. But it's reasonably safe to assume that it never foresaw Fields' work.

It is well known that hexachlorocyclopentadiene easily adds to the olefinic bond of such conjugated systems as acrylonitrile and maleic anhydride. But it took Fields to show that the compound also readily adds (at temperatures as low as 85 C) to simple olefins containing only one double bond.

The new reaction was tested with 16 olefinic materials* ranging from 1-hexene to such complex representatives as DL-limonene, dicyclopentenyl alcohol and butadiene monoxide.

Results, highly promising, are generating a justifiable degree of optimism.

Among the new chemicals produced by the novel reaction are a stable alcohol containing 64% chlorine (from allyl alcohol) and a pair of compounds (from cyclohexene and 4-methylcyclohexene-1, respectively) that, in Fields' words, "have exceptional insecticidal activity."

* Products of these seven companies: Columbia, Eastman Kodak, General Aniline, Hercules Powder, Humphrey-Wilkinson, Phillips Petroleum, Rohm and Haas.

ARF'S MURER and GAVLIN: Scanning the files for chemicals that are . . .

Rare and Registered

Last week marked the twelfth anniversary of a unique industrial helpmeet: Armour Research Foundation's (Chicago) National Registry of Rare Chemicals. Founded on June 1, '42, the registry is a clearing house for information on unusual chemical compounds, helps track down hard-to-find chemicals.

Hub of the registry's functions is a card index showing the source of more than 25,000 rare compounds, which are not regularly listed or stocked by chemical supply houses. A staff of two—director Gilbert Gavlin and secretary Alieta Murer—keep the index up to date (3,500 additions last year), answer the organization's steady influx of queries.

Since its inception, the registry has had inquiries from Argentina, Australia, Belgium, Canada, Chili, Cuba, Czechoslovakia, Denmark, England, Egypt, France, Germany, Hawaii, Holland, India, Mexico, Norway, Spain, Sweden, Switzerland, the Union of South Africa, Ireland, the Republic of Lebanon, Philippine Islands, and from every state in the Union.

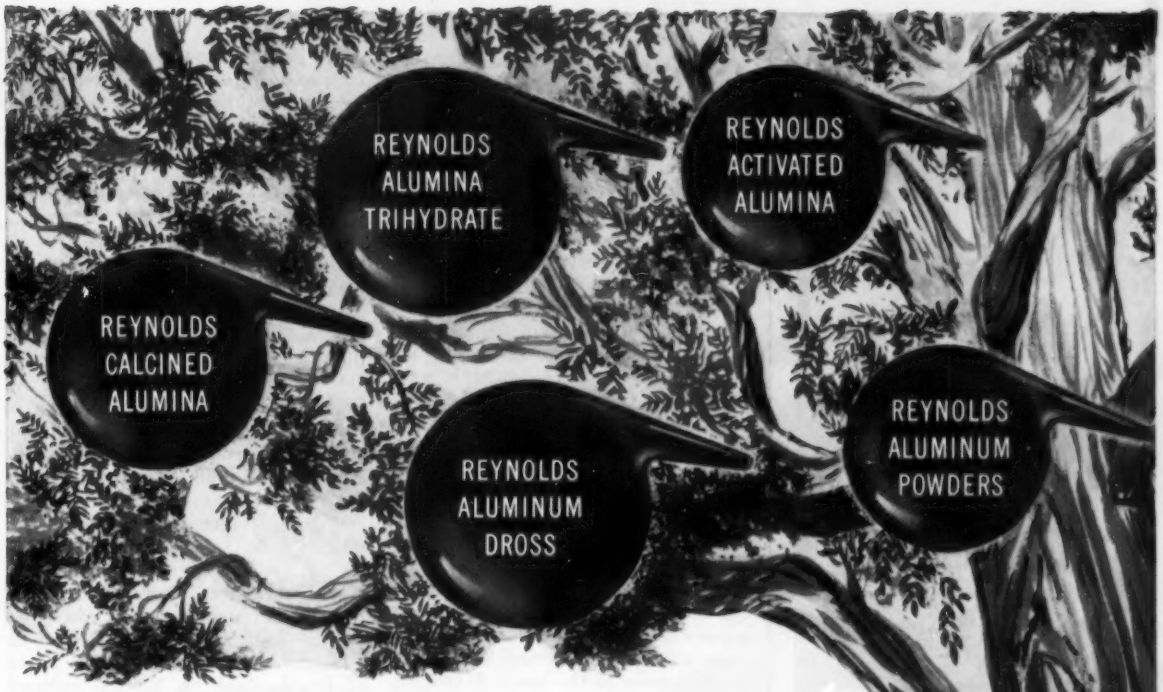
Three out of every four chemicals can be quickly located with the index. More elusive customers are often pinpointed with the aid of leads supplied by scientists working with similar compounds. The registry has also had some success in locating odd chemicals by means of notices published in various scientific journals.

While the registry is primarily an information source (neither buys, sells, nor stocks any chemicals), it will act as an intermediary in negotiations when the supplier wishes to remain anonymous. Strict confidence is observed in transmitting price information, chemicals, and payment.

Although its exact beginnings are obscure, the registry was probably conceived early in 1942 when Armour chemists were asked to locate a few grams of 1,1-dichloro-1-nitroethane, a then obscure compound. It took a month to locate enough for experiments by the interested party—an insecticide manufacturer. Today, hard-to-find materials like dimethylhydroxylamine, trinaphthylmethane and isophthalaldehyde are ferreted out in a fraction of that time, using the systematic approach provided by the registry.

At the start, only a few hundred requests were handled annually; last year the number was up to 8500 and still on the upswing.

Although the service is free, some users insist on showing their gratitude. An automobile dealer who sought a "rare" chemical to remove decals from windshields was so happy to learn about trisodium phosphate that he offered a good deal on a new car in exchange.



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REYNOLDS CHEMICALS

FROM THE PRODUCERS OF REYNOLDS ALUMINUM

Variation on a Theme

Taking a fundamental theme in the chemistry of optical bleaching agents, American Cyanamid's Bound Brook, N. J., researchers have fashioned several potentially rewarding variations. Two new dye intermediates and a handful of new whiteners are the result of their handiwork.

Still in development, several of the new compounds are likely candidates for commercialization.

All of the neophytes can thank 4,4′-diaminostilbene-2,2′-disulfonic acid (DAS) for their discovery. Comprising dichlorodiaminostilbenedisulfonic acids and derivatives, they spring from the efforts of Calco chemists to find hypochlorite- (laundry bleach) resistant relatives of this familiar* ultraviolet-absorbing structure (DAS).

To this end, researchers Delton Hein and Elliot Pierce prepared and tested 5,5′-dichloro- and 6,6′-dichloro-4,4′-diaminostilbene-2,2′-disulfonic acid and such nitrogen-substituted derivatives of the former as the benzoyl; anisoyl; furoyl; *o*-ethoxybenzoyl; 2,4-dimethoxybenzoyl; phenoxyacetyl; phenylcarbamyl; *o*-phenoxybenzoyl; 2,4-dianilino-1,3,5,-triazinyl; β-naphthoyl; 4-chlorobenzoyl; sorboyl; and 4-diethylaminobenzoyl.

Both 5,5′-dichloro-DAS and the 6,6′-dichloro-DAS are interesting dye intermediates. And with the exceptions of the three last-named 5,5′-dichloro-DAS derivatives (sorboyl, 4-chlorobenzoyl and 4-diethylaminobenzoyl), the entire group shows appreciable fluorescent dyeing strength; its ultraviolet-absorbing characteristics parallel those of the parent DAS derivatives.

Moreover, state Hein and Pierce, the 5,5′-dichloro-DAS offshoots are "unusually resistant" to attack by laundry bleach, being "almost unaffected by contact with it in aqueous solution or on the fiber."

An added dividend is the ability of the new chemicals to whiten soaps and detergents. Here, too, they excel their DAS prototypes, which usually cause some yellowing.

•

Surface Research: New York University has a new laboratory for its surface-technology research. Consolidating work formerly carried out in several smaller labs, the new layout is committed to a comprehensive program of research, embracing treatment of surfaces by chemical and electrochemical means; spraying with metal particles; inorganic and organic surface treatments; and development of systematic research and evaluation methods relating to the application of finishes and the preparation of surfaces before treatment. The expanded facilities handle sponsored studies for industry and government.

•

Sour Milk: Milk-souring bacteria are controlled by addition of menadione (2-methyl-1,4-naphthoquinone, a vitamin K-like substance) to the cow's diet, according to new findings by University of Florida researchers. At 98.6 F, milk from treated cows is reported to last 18-24 hours without souring, twice as long as ordinary milk. And at 50 F, milk from cows getting the chemical is said to stay fresh for 20 days, 4 times longer than the control milk.

•

New Fluoridator: Results of a recently concluded research project sponsored by the Indiana University school of dentistry and the Indiana state board of health show tin fluoride reduced tooth decay of the test subjects by 60 to 70%, compared with 30 to 40% when sodium fluoride was used. Tests covered a span of 10 years, were made on 2,500 children aged 6 to 15.

•

Mosquito Repellent: Recent Bureau of Entomology and Plant Quarantine (Beltsville, Md.) tests indicate that esters of mandelic acid and N,N-diethylamides are promising mosquito repellents.

•

Low Pressure: A series of powerful new hypotensive agents derived from nicotine have been uncovered by Wellcome Research Laboratories (Tuckahoe, N.Y.). They are di-quaternary ammonium salts made by catalytic hydrogenation of nicotine salts, followed by a reaction with one of several alkyl halides. All materials screened were derivatives of 3-(4′-aminobutyl)-piperidine.

•

Sponge Center: More than $1 million is earmarked by General Mills' O-Cel-O Sponge division for a new research center and finishing plant. Proposed site: the Buffalo (N.Y.) area.

•

Aimed at the Lab: Three items highlight this week's lab instrument and equipment news:

• Fastest recording spectrophotometer yet developed, is the claim for the Warren Spectracord, a new instrument from Fisher Scientific Co. (Pittsburgh). The device is claimed to automatically scan and record the entire

*Such N,N′-derivatives of DAS as the benzoyl; 2,4-disubstituted-1,3,5-triazinyl; and phenylcarbamyl are in common use for whitening cellulosic fabrics.

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visible or ultraviolet spectrum in less than a minute. That, says Fisher, is considerably less time than is required by similarly priced available instruments. Added feature: components are packaged in replaceable plug-in units that facilitate on-the-spot repairs.

• A new line of quartz shapes, manufactured by Microchemical Specialties Co. (Berkeley, Calif) is intended for microanalytical laboratories. Available are breakers, flasks, boats, graded seals, ground joints, capillary pipets. Feature: extremely high ultraviolet and visible radiation transmission.

• Wm. Ainsworth & Sons, Inc., (Denver) is now producing an unusual new balance. Utilizing only one pan, the balance is claimed to be much faster and easier to use than conventional analytical instruments. Capacity is 200 grams; sensitivity, 0.1 mg. All necessary weights are built in, operated by knobs in the case-front. Counters show the total of weights employed.

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Toxicant Progress: Six new U.S. patents point to potential markets for these toxicant chemicals:

• N,N′-phthalylhydrazine and its metallic salts, described as fungicides in patent 2,654,689 (Ethyl Corp.).

• Dibasic silver salts of alkenyl succinic acids, found to be effective against potato blot, black rot of sweet potatoes, brown rot of fruit and apple scab. It's covered by patent 2,655,460 (Allied Chemical & Dye).

• N-aminophthalic imide, claimed as fungicide in Ethyl Corp.'s patent 2,657,169.

• Halogen-containing polycyclohexenones are listed as herbicides in patent 2,657,126 (B. F. Goodrich).

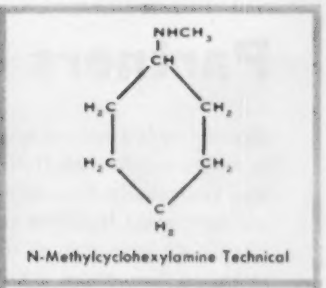
• Fluorenone compounds, specified to be efficient herbicides, according to patent 2,653,864 (Monsanto).

• Alkylfurfurylidenecyanoacetate, described as a herbicide in patent 2,653,886 (Monsanto).

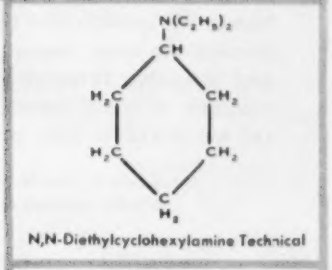
•

Ideas Wanted: Researchers with bright new glycerine ideas have a chance to garner the 1954 annual Glycerine Producers' Assn. (New York) research award. Idea of the award is to foster application research on glycerine and its derivatives. But exploration of basic scientific principles or procedures that are likely to stimulate future glycerine uses may also win one of the three cash prizes. Last year's top award went to Erich Baer, University of Toronto, for his synthesis of glycerol phosphatides. Nominations must be made on the official entry

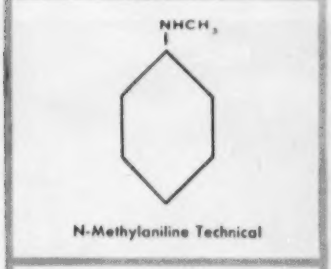
Versatile intermediates, solvents and acid acceptors



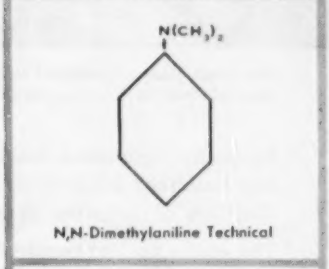
N-Methylcyclohexylamine Technical



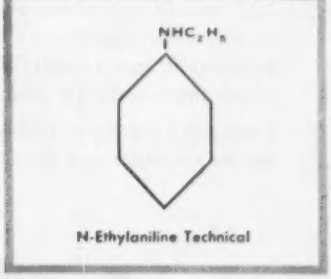
N,N-Diethylcyclohexylamine Technical



N-Methylaniline Technical



N,N-Dimethylaniline Technical



N-Ethylaniline Technical

DU PONT N-METHYLCYCLOHEXYLAMINE TECHNICAL

AND RELATED COMPOUNDS

N-METHYLCYCLOHEXYLAMINE TECHNICAL is a water-white liquid with a specific gravity of 0.86 at 20°C. It is soluble in both alcohol and ether but only slightly soluble in water. It may show traces of cyclohexylamine and N,N-dimethylcyclohexylamine.

SPECIFICATIONS: Purity: 99% minimum
Methylaniline content: 0.3% maximum
Distillation range: Distills 5 to 95 cc. within 2.0°C., including 149°C, corrected to 760 mm.

OTHER ALKYLATED ANILINES are available on request from Du Pont. Be sure to get in touch with us if your process calls for any member of the aniline group. Remember, too, Du Pont has the facilities to develop specific intermediates, custom-made to fit your requirements. A request on your letterhead will bring complete information.

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RESEARCH . . . . . .

blank, obtainable by writing to the association. Deadline for receipt of nominations is Nov. 1, '54.

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Silicone Coating: Allied Chemical & Dye (New York) claims high water repellency for a stable, new siloxanol coating described in patent 2,679,495.

•

Dual Role: Erected at a cost of $3.5 million, Rutgers University's sparkling new Institute of Microbiology (New Brunswick, N.J.) will stress fundamental research. But according to its director, Selman Waksman, it won't be to the exclusion of practical industrial studies. Financed by the royalties on streptomycin (of which Waksman was codiscoverer), the new research center is contemplating industrially significant projects in the fields of enzymes, vitamins, organic acids, etc.

Antibiotics, of course, will have the spotlight, command the best part of the efforts of the institute's six major divisions: general microbiology, microbial physiology, antibiotics, vitamins and enzymes, ecology of microorganisms, and applied microbiology.

Second major addition to the mushrooming Rutgers Science Center, the new building follows on the heels of the $1.5-million Ralph G. Wright Laboratory dedicated to chemical research and instruction. Still in the planning stage are research units for ceramics, engineering, geology.

•

Plastic Plumbing: A sink made entirely of polyethylene is the newest offering of Arthur S. La Pine & Co. (Chicago), suppliers of laboratory equipment. Other new items: portable bath cooler, electrothermal heating tape and a line of polyethylene labware.

•

Birth of a Team: Eastman Chemical Products (Kingsport, Tenn.) has just closed out its year-old evaluation of butylated hydroxytoluene (BHT) as a food anti-oxidant. Finding: BHT appears most useful in combination with butylated hydroxyanisole (BHA). A synergistic pair, the two anti-oxidants are the active components of a new Eastman product designated Tenox IV.

•

On the Line: A novel system of chemical notation, limited to the symbols on the standard typewriter keyboard, is spelled out in a new book by William Wiswesser, chemical research head of Willson Products (Reading, Pa.). Title: "A Line-Formula Chemical Notation." Price: $2 (Thomas Y. Crowell Co., New York).

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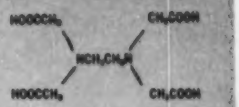

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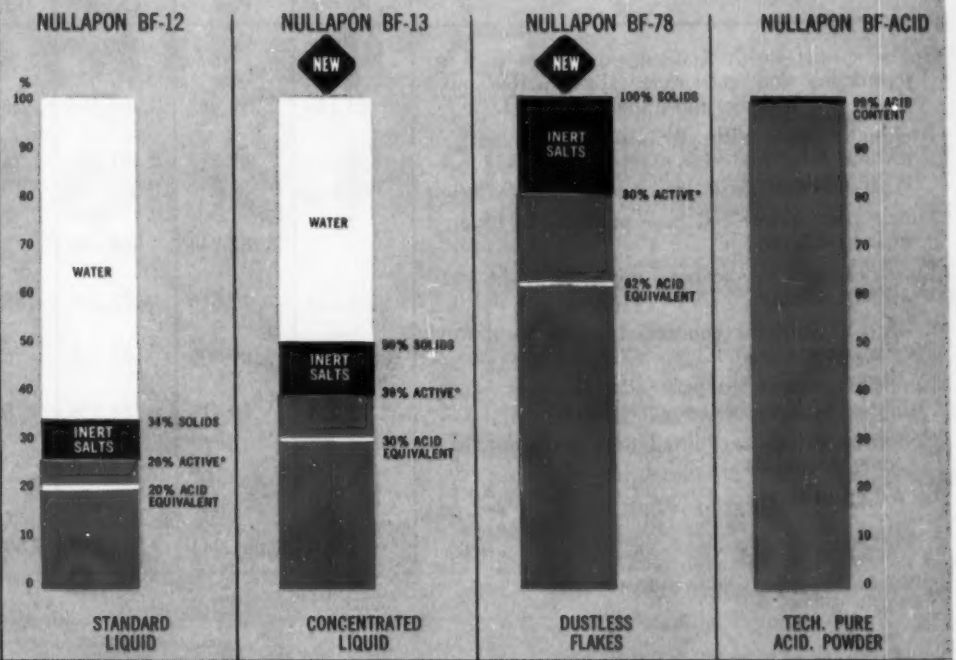

	STANDARD LIQUID	CONCENTRATED LIQUID	DUSTLESS FLAKES	TECH. PURE ACID. POWDER
Active* Principal	Tetra Sodium Ethylene-diamine Tetraacetate 25-27%	Tetra Sodium Ethylene-diamine Tetraacetate 38-40%	Tetra Sodium Ethylene-diamine Tetraacetate 78-80%	Ethylenediamine Tetraacetic acid (Tech. Pure) 99%
Physical Form	Clear Liquid	Clear Liquid	Non-hygroscopic Flake	Powder
Density	1.2 (10#/gal)	1.3 (11#/gal)	.6 (5#/gal)	.7 (6#/gal)
Molecular Weight of Active Ing.	380	380	380	292
100 Parts of Nullapon Controls	6.7 parts $CaCO_3$	10.0 parts $CaCO_3$	20.0 parts $CaCO_3$	33.5 parts $CaCO_3$ when used in alkaline solutions
or . . . 1 oz. by weight in ten gallons of water controls	49 PPM $CaCO_3$	73 PPM $CaCO_3$	146 PPM $CaCO_3$	245 PPM $CaCO_3$ when used in alkaline solutions
STANDARD PACKING	500 lb. Drum 50 lb. Drum 10 lb. Drum	500 lb. Drum 50 lb. Drum 10 lb. Drum	200 lb. Drum 25 lb. Drum 5 lb. Drum	250 lb. Drum 25 lb. Drum 5 lb. Drum

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Household and Industrial Insecticides Sales At Manufacturers Level 1953

	Number of Units				
	Less Than Pint	Pint	Quart	*Gallon	†Over One Gallon
Space sprays—with knockdown agents such as pyrethrins and activators, thiocyanates, allethrin, etc., with not more than 2% DDT	24,139	8,275,905	3,203,464	250,092	222,805
Residual sprays—with 2½% to 6% DDT with or without other materials except chlordane	828,332	7,302,211	2,491,856	260,904	47,441
With chlordane, with or without other materials	883,421	9,181,966	2,651,146	100,780	25,230
Fabric pest sprays—oil base products to be used without dilution		1,282,244	509,486	22,128	33,371
Livestock sprays—oil base products to be used without dilution	8,212	12,516	75,741	862,106	875,064
Livestock emulsion concentrates—to be diluted with water	60,641	86,686	199,163	61,805	18,118
Emulsion concentrates other than livestock —to be diluted with water (nonagricultural)	22,224	60,416	122,376	33,254	61,102
Concentrates—to be diluted with petroleum base (nonagricultural)	0	0	0	89	12,563
Stored grain sprays	0	0	0	9,849	14,922
TOTAL	1,826,969	26,201,944	9,253,232	1,601,007	1,310,616

*Includes half-gallon sizes on gallonage basis.
†Data in gallons.

Charting Industries' Progress

A pair of product surveys valuable to the whole industry were introduced last fortnight at the Chemical Specialties Manufacturers Assn. meeting in Cincinnati. Covering household and industrial insecticide sales (manufacturers' level) and aerosol production, they are as accurate, detailed and current as any studies available to the specialties and process industries.

The CSMA's insecticide division went to particular pains in its survey program. The second of the group's polls, the survey casts back to earlier years, so that in addition to data on '53, (*see above*), similar charts on '51 and '52 sales are also available on nonagricultural pesticides. Going back even further, a somewhat less detailed breakdown for most of the same products was prepared for 1940 and 1945.

The latter breakdown is in many ways most indicative of the growth of the field. Where in 1940 insecticide gallonage was under 4 million (3,120,928 in packages, 809,074 in larger cans), it was 9.6 million in '53.

Despite the nearly 10 million gal. sales in 1953, that year was considerably under '52's record sales of more than 11 million gal., George Fiero, (Esso Standard Oil) asserts.

Insecticides for space sprays, however, continued to climb in popularity. This was true in the case of both pint- and quart-size packages—the largest selling units for this type product: the '53 figure of 8,275,905 compares with 7,452,490 ('52) and 6,970,646 ('51) pint units; and 3,203,464 ('53), 2,939,232 ('52) and 2,843,265 ('51) quarts. (Space sprays are categorized as those products that contain pyrethrin-like knockdown agents with synergists, and not more than 2% DDT.)

One of the fastest-climbing products of the '52 year (and still good in '53) was the fabric pest spray—oil-based sprays applied to clothing to reduce insect damage. Primarily a consumer item, little of the fabric spray was sold in any sort of units other than quart and pint. Growth chart: 77,849 pint units moved in '51, 1,447,193 sold in '52, and a steady 1,282,244 in '53.

Oil-based livestock sprays also showed a continuing rise in '53. The bulk gallonage of the sprays reached 875,064, a major jump over 705,576 gal. ('52) and 664,454 ('51). In the gallon-size container, too, a gain was registered—it's up to 862,106 gal.—a new record.

In many other areas, however, sales slipped. This was particularly true of residual insecticides, of which there are two main classifications now—those with DDT (2½-6%) or chlordane (generally 2%). Since '51 the pint units of DDT types has dropped from about 8,111,744 to 7,382,656 ('52) and 7,302,211 ('53). A similar dip was noted in quart units.

Chlordane types reached a record high of 9,717,313 pint units in '52, fell off a little last year, but held over the 9-million mark. In quart units '53 sales (2,651,146) were below the '51 mark of 2,862,556.

Aerosol's Spurt: Still clinging to its

remarkable rate of climb is the aerosol industry. A lusty 140 million units were filled last year—45% more than the preceding year, when the total of 96 million units was more than twice that of '51 (for nonfood products).

Precision Valves' Fred Lodes presented the study to the Aerosol Division. Broadening the surveying system by including can manufacturers and valve makers—some 17 of them—the division got a solid cross-check on production.

Some 37 aerosol fillers (of 68 queried) reported production of 131,515,442 units. The valve makers turned out 145 million units, the can makers, 142 million, which Lodes reports is probably closer to actual production figures for complete units, hence his 140 million estimate. A few of the 31 nonreplying fillers, it seems, represent a good share of output.

The individual breakdown figures, although not complete, can be pretty well adjusted with the help of statistics from can and valve makers. Such adjustment yields some striking evidence of growth in certain products. Among them:

- Insecticide sprays are still climbing in popularity; 11 million more units were packed in '53 than in '52.
- Shaving cream output almost doubled, according to estimates, with approximately 32 million units (chart figure of 24 million expanded by Aerosol Div. in accordance with can, valve production) turned out in '53.
- Pigmented pressure-packed coatings also doubled in number, totaling more than 8 million in '53.
- Hair lacquers, separately listed in '53 for the first time, almost tripled in volume, Lodes estimates, with 15 million produced.

Secret Poll: Both the aerosol and the insecticide surveys were conducted by the CSMA, with the accounting firm of Ernst and Ernst receiving and tabulating all figures (and destroying all returns) so that the secrecy of individual companies' sales volume would be assured.

Besides the surveys produced on these pages, the CSMA (110 E. 42nd St., New York) has the full Insecticides survey available (including revised '52 and '51 charts), and the Aerosol survey for the past three years.

Aerosol and Pressurized Products Survey — 1953

Product	Number of Units Packed: Twelve Ounce	Six Ounce and Less	Total
Space insecticides	33,236,303	2,056,402	38,949,995*
Residual insecticides—roach and ant sprays, etc.	3,790,120	660,402	4,450,522
Mothproofers	3,579,813	255,624	3,835,437
Room deodorants	7,444,148	8,325,597	15,769,745
Pigmented and metallic paints	7,752,631	504,001	8,256,632
Clear plastic sprays	2,191,722	168,711	2,360,433
Other household products—waxes, insect repellents, etc.	1,729,718	613,874	2,343,592
Shaving lather	2,280,893	22,018,352	24,299,245
Hair lacquers	8,201,652	6,918,480	15,120,132
Other personal products—shampoos, perfumes, etc.	1,154,976	2,624,902	3,779,878
Medicinals and pharmaceuticals—athlete's foot, burn preventives, etc.	164,953	666,348	831,301
Snow—all types	7,368,656	1,533,429	8,902,085
Miscellaneous products—dog sprays, mildew preventives, lubricants, etc.	1,680,268	936,177	2,616,445
TOTAL	80,575,853	47,282,299	131,515,442*

Note: This survey includes only nonfood products.
*Total includes 3,657,290 high-pressure units.

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*Produced by the Sugar Cane Wax Enterprise, Gramercy, Louisiana refinery.

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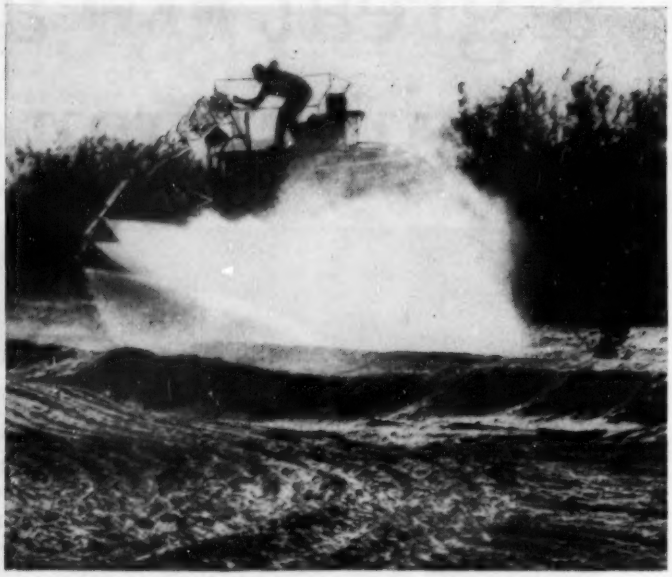


SAND BINDER: Sprayed on the desert sands around Imperial, Calif., sulfite liquor-binder halts wind erosion.

Chemical Cover Crop

More ways than one of utilizing sulfite cooking liquor from paper mills are in the news. Wisconsin operators visualize it as a road binder (CW, May 29, p. 56). And Crown-Zellerbach Corp. (San Francisco) is looking at its Orzan, a spray-dried sulfite liquor, as a wind erosion preventive.* But like its Midwestern competitors, C-Z is just getting this phase of its Orzan project started. So far it has been testing, hasn't come up with enough answers yet to launch commercial exploitation.

Nevertheless, the C-Z bid is a timely one. In spite of recent rains there's still talk of dust bowl conditions in the Colorado area, and in many parts of the West wind erosion is a serious problem. Application of Orzan A, at $10-20 per acre, might help save a lot of this farmland.

More than that, C-Z is exploring application to irrigation canal banks and the sand dunes that surround cultivated land in irrigation-farming areas (such as along the All-American Canal in California's Imperial Valley). For such treatment, C-Z suggests use of a cover crop, too—the Orzan holds the soil in place until the grass crop can take over.

Chemical Crust: Orzan A is a coffee-colored, granular solid that is dissolved in water before application from a spray truck. Spread thinly over loose soil or sand, it binds the particles into a crust (*see cuts*) which lasts about six weeks under normal conditions.

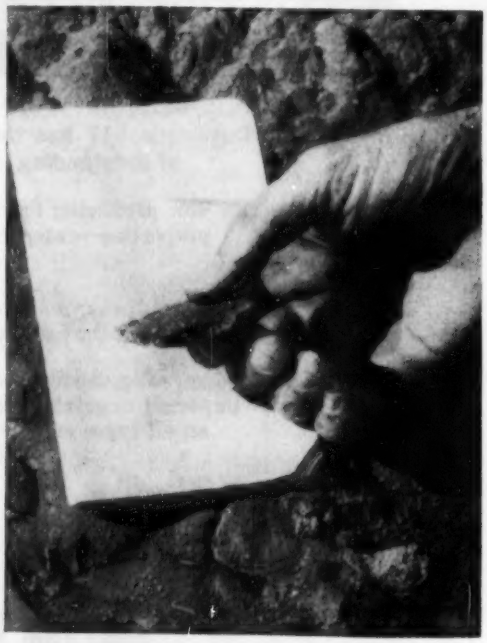
Preliminary results of test applications by the Imperial Valley Irrigation District, and by others in the Columbia River Basin, indicate effective control can be obtained with about 150-300 lbs. of Orzan A per acre—depending on soil, wind and water conditions and type of crop. (Orzan A is priced at about $65/ton f.o.b. Lebanon, Ore.) The nitrogen and sulfur in the binder appears to be readily available to plants after the crust has deteriorated, but it is, of course, too expensive to regard as a fertilizer.

Orzan is essentially dried ammonia-base sulfite liquor. (It comes from the cooker blow-pits with about a 9% solids content.) Collected, filtered and processed in a Rosenblad plate-type evaporator, it is concentrated to about 48% solids.

This heavy, molasses-like concentrate is then spray-dried in a Swenson drier, cooled and bagged. Addition of a new drier early this year gives C-Z a 30-ton/day capacity for Orzan.

The crust-former seems to be compatible with most herbicides and insecticides. It might thus be applied during the seeding of a cover crop, to pin down the soil.

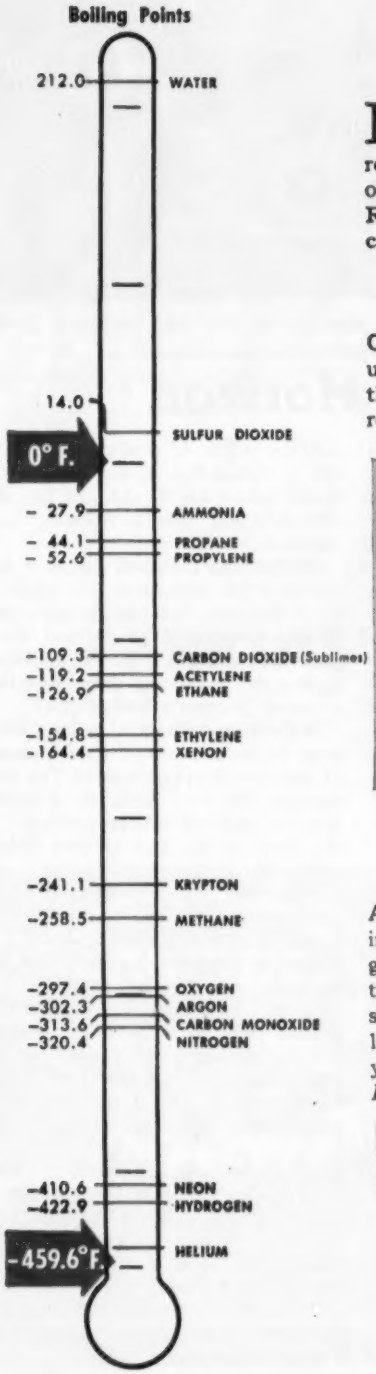
Although it isn't termed a soil conditioner, it has soil stabilization characteristics. And to learn the full story on Orzan's agricultural properties, C-Z is continuing its experiments. Until then, it's selling the product to agriculturalists strictly on a development basis.



CRUST: Until cover crop takes hold, crust prevents another dust bowl.

* Orzan, too, can be used for roadbinding, but the majority goes into diverse jobs—dispersant in asphalt emulsions, gypsum, drilling muds; liquid forms serve as foundry core binders, etc.

NEW PROFITS thru Low-Temperature Liquefaction and Separation of Gases



Take Dollars out of By-Product Gases, Natural Gas, Air; Cut Storage Costs

Low-temperature processes open new profit possibilities for the chemical, petroleum, steel and related industries. They make it feasible to recover valuable products from many gas mixtures . . . or, used in place of other recovery methods, widen profit margins. (See examples in chart.) Reduced to a liquid state by low temperatures, gases such as natural gas can also be *stored* at less cost.

What Can Low Temperatures Do For You?

Consider your fluid flows, or mixtures you now dispel or burn as waste, use for fuel, or can get at low cost (natural gas) or *no* cost (air). Can these "resources", plus low-temperature processing, provide additional revenue?

SOURCE	PRODUCT
Refinery gas, Natural gas, Coke oven gas, Cracked products	Hydrogen, Ammonia synthesis gas, Methane, Ethane, Ethylene, Propane
Cracked products	Ethyl benzene
Air	Oxygen, Nitrogen, Argon

SOURCE	PRODUCT
Refinery fluids	Dewaxed oil, Benzene, Toluene, Xylenes
Ammonia purge streams	Argon
Reactor gases	Sulfur dioxide
Carbon dioxide	Dry ice

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SEIBERLING'S SEIBERLING (right) checks rigid PVC with enthusiast Leedy.

Broad as the Horizon

This summer Seiberling Rubber Co.'s plastics plant at Newcomerstown, O., will start to turn out Seilon, a rigid polyvinyl chloride sheet. Chief reason: Seiberling thinks its potential uses are as broad as the horizon.

Right now the company is manufacturing 4x6 ft. sheets on a small scale at the home plant in Barberton but at Newcomerstown it will be able to make them 4x8 ft. The plant will first produce low-impact material at the rate of 1.5 million lbs., will later make high-impact PVC, which Seiberling sees eventually forging ahead of the low-impact variety. At present only a few other companies turn out large-size PVC sheets.

Initially, the rubber concern is aiming at the construction materials field for Seilon—for sheathing, duct work, pipe flanges, particularly in the chemical industry. The automotive industry is another potential user, it believes, especially if the price of rigid PVC can be reduced. (The company's already producing and fabricating a PVC seat guard for a major auto maker.)

Enthusiast: Mainly responsible for the company's move is a self-taught engineer and production man, A. A. Leedy, who has headed the New Products Dept. since it was established in 1951 (*see cut*). Once Seilon gets going, Leedy wants to expand into other lines.

Specifically, he'd like to make a rigid styrene copolymer as well as a vinyl-steel laminate. Two other products he wants to produce and push are a leather-like plastic using PVC sheet, which his department has developed, and also a foamed vinyl plastisol.

Deliberated Decision: Leedy is not alone in his enthusiasm for plastics. H. P. Schrank, Seiberling's vice-president in charge of production, foresees the company's plastic activities as one day exceeding its present tire business (currently $40 million).

Seiberling deliberated a long time over its move into rigid PVC because of previous disappointments. The first attempt the firm made to diversify was via molded rubber products in the late 1930s. This project didn't work out.

Since last year's total rigid vinyl production is estimated at around 3 million lbs., and Seiberling has a 1.5 million-lb. capacity, it's clear that the company is making a robust bid for business. Just how big rigid PVC growth will be is anybody's guess. But one estimate is that it may go to 200 million lbs. in the next 15 years. Thus, Seiberling—and its contemporaries—harbor few fears for the future.

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Delustrant: Emkay Chemical Co. (Elizabeth, N.J.) has brought out a delustrant for nylon tricot. It is a dispersion of titanium pigments in a cationic resin carrier and binder. It's tradenamed Rexodull CNY.

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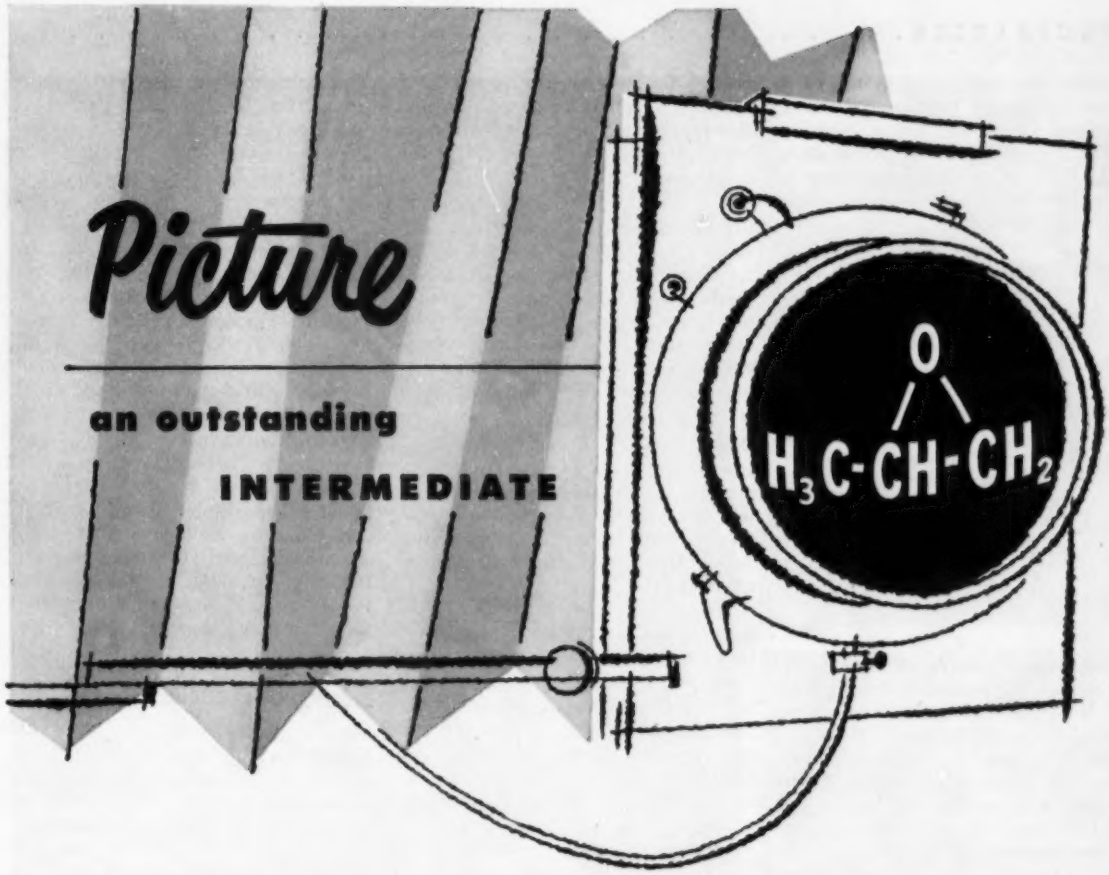
Phthalate Plasticizer: Pittsburgh PX-118, an iso-octyl decyl phthalate plas-



CARBIDE'S PROPYLENE OXIDE

To meet the increasing industrial need for this excellent intermediate, CARBIDE has expanded its production of propylene oxide. Since it reacts with all compounds having an unstable hydrogen atom, a variety of applications are possible.

Two of the uses are in the production of petroleum de-emulsifiers and textile lubricants. Propylene oxide is also an effective stabilizer in the formulation of products from resins that contain chlorine.

Your CARBIDE technical representative is ready to discuss these and other applications of propylene oxide. A Technical Information Sheet on propylene oxide is available from the CARBIDE office nearest you; ask for F-8485. In Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.

* * *

An added highlight of CARBIDE's propylene oxide expansion is the increased availability of propylene oxide polymers. Such polymers as UCON fluids and polypropylene glycols 150, 425, 1025, and 2025 are excellent lubricants and also may be used in hydraulic fluids. For additional information on propylene oxide polymers, ask for the booklets, "UCON Fluids and Lubricants" (F-8326) and "Polypropylene Glycols" (F-7220).

"Ucon" is a registered trade-mark of Union Carbide and Carbon Corporation.

CARBIDE AND CARBON CHEMICALS

Carbide and Carbon Chemicals Company
A Division of
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ticizer is now being sold by the plasticizer division of Pittsburgh Coke & Chemical Co. It has lower volatility and a higher degree of permanence than DOP. In general, the product is compatible with all resins for which DOP is satisfactory.

•

Two In One: Monroe Co., Inc. (Cleveland) is marketing a new reinforcing fabric—No-Rot—which it claims will reduce man hours and costs approximately 50% on roof resurfacing jobs. Developed in conjunction with the company's Rufferseal siliconed roof coating, the product is composed of glass fiber threads woven together in a mesh-like screen. To use, No-Rot is placed on a roof, then coated with Rufferseal, which flows through to form a binder as well as a protective coating. Thus, both binding and top coating are accomplished in one operation.

•

Cleaner and Speedier: A new short run duplicating process that its maker says is cleaner and speedier has been developed by A. B. Dick Co. (Chicago). The way the process, called Azograph, achieves cleanliness is by chemically separating the two color forming compounds within the coating of the transfer sheet. These compounds cannot unite to form color until a third element, a reactant in the fluid, is introduced within the duplicator. Thus it is impossible for operators to get stained. The process can produce up to 50 copies.

•

Bicycle Polish: A polish for bicycles is the latest product to be sold by Plastone, Inc. (Chicago). Recommended for spokes and other chrome work Tommy Turtle Bicycle Polish contains silicones, synthetic resins and carnauba. Package: 7-oz. can (price 49¢).

•

Vinyl Inks: Claremont Pigment Dispersion Corp. (Brooklyn, N.Y.) now sells a series of vinyl inks in concentrated form for gravure and silk screen printing of rigid vinyl plastics.

•

Add Three: Du Pont recently licensed three companies to make its Varigam variable contrast photographic paper. They will market it under their own brand names. The companies: Ansco, (Binghamton, N.Y.), Haloid Co. (Rochester, N.Y.), and Grant Photo Products, (Cleveland).

•

Quicksilver Dispenser: Polyethylene squeeze bottles are turning up as mercury dispensers for small jobs such as filling manometer tubes. Among the advantages of the new container—flow rate of the mercury can be regulated by pressure on the bottle sides, and the tough, flexible bottle eliminates breakage hazards in handling the heavy fluid.

•

Bill Withdrawn: A bill to repeal Louisiana's "fair trade" law was withdrawn last week after an unfavorable report by the state's House judiciary committee. Attending the hearing was John Schwegmann, Jr., who said the present law forced him to collect an unreasonable profit on some items.

•

One in the Hose: Beverly House (Beverley Hills, Calif.) currently sells a product, which, when dropped in hose, will "feed plants and brighten lawns" as they are watered. Name: Vita-Spray Plant Food Pellet. Price: $1 for a box of 30.

•

Revision Recommended: A revision of Household Insecticide (Liquid Spray Type), Commercial Standard CS72-38, has been recommended by the Standing Committee of the industry and is now being circulated by USDA's Commodity Standards Div. to the trade for written acceptance. The committee's suggestion: that the present title be changed to Household Insecticide (Liquid Space Type for Flying Insects) to distinguish the product from those used against crawling insects.

•

Helping Children Bounce: The U.S. Rubber Reclaiming Co., Inc. (Buffalo) is turning out a reclaimed-rubber and asphalt compound "to put the bounce into children's playgrounds." The company says powdered reclaimed rubber is mixed with asphalt in the plant and this combination in turn is mixed with conventional asphalt on a playground site.

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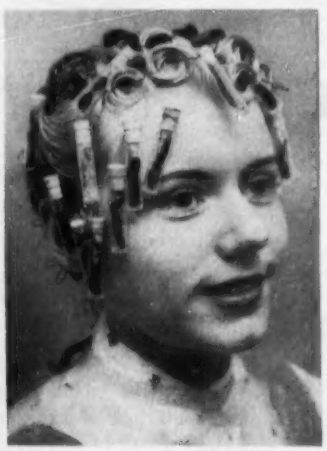
Small Rings: Subminiature O-rings and other microscopic rubber parts are manufactured by Minnesota Rubber and Gasket Co. (Minneapolis) rather than Minnesota Mining and Mfg. Co. (*CW, May 22*).



WIDE WORLD

Beauty In Bottles

POPULAR IN PARIS, a new method of controlled bleaching of the hair is on its way to becoming popular here. Pushing the two-month-old idea is Clairol Inc. (New York), which sells the kit to beauty-shop owners. The goal—sun-tipped ends—is realized by wrapping hair strands around plugs that fit into bleach-containing plastic bottles. It's speedy, too—takes only 15–20 minutes.

Encore Aerosols

On the subject of aerosols, Du Pont reports the following:

• A whole new area of packaging applications may soon open with the development of push-button dispensing of dry powders. Among the first aerosols of this type are dry graphite lubricants and zinc stearate mold release agents for use in plastics molding. Injection Molders Supply Co. (Cleveland) aerosol-packs a typical dry release agent—it is said to give more uniform, less wasteful dusting than existing types of powder applicators.

• An aerosol paint remover formula that produces a foaming action faster and more active than brush-applied types has been developed by Du Pont's Kinetic Chemical Div., which offers it to packagers. The company says one aerosol application may be equivalent of two by brush. Although it is equally effective with enamels and nitrocellulose lacquers, the biggest advantage, Du Pont asserts, is with varnish.

• Air in finished pressure-loaded aerosol products may result in pressures above desirable safety limits. Major source of excess pressure is air in gas space of incompletely evacuated containers. But as is pointed out in a revised bulletin (KTM-15) air might also be dissolved in the materials used in the formulation. The company's aerosol chemists have found that the exact amount of excess pressure depends on the nature of the product packaged, the amount of the fill and the temperature.

DOW

Sturdy new open-head drum ships, handles and stores better under all conditions; improved recessed-head ring lock grips tighter, opens and closes more easily and with greater safety.

NOW— DOW CAUSTIC SODA in a new FULL OPEN-HEAD DRUM with superior shipping, handling and storage features

Dow caustic soda flake and ground flake is available *today* in a new full open-head drum, designed and manufactured exclusively by The Dow Chemical Company. Stronger and easier to handle, this drum's unique construction makes long-preferred Dow caustic an even better buy.

This sturdy premium drum features an exclusive recessed-head ring lock that *reduces damage* in shipping and handling, *saves space* in storage. The smooth outer surface prevents climbing or riding during transit. The swedged-in head design, another exclusive feature, assures all the advantages of open-head construction without the drawbacks experienced with other drums of this general type.

Available on request at a slightly increased cost from all Dow terminals, warehouses and plants, this drum is demonstrably the best shipper and storage container in the caustic field. Added to Dow caustic's uniform high quality and dependably prompt delivery from all plants and distribution terminals, this superior new drum presents one *more* good reason for placing your order with Dow. THE DOW CHEMICAL COMPANY, Midland, Michigan.

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PLASTICIZER removal by extraction paves way for contamination assay.

Scrap in Plastics

Booming as it never boomed before, the plastics industry squeezed out last year some 2.6 billion lbs. of product. Hence it's not surprising that the amount of plastic waste has also risen. Virtually every plastic fabrication leaves some tailings and shavings, entails some breakage. Also, as a result of occasional overproducing, fabricators often face the problem of "what to do with scrap plastic." Fortunately for the molder, an out exists.

For if the material is thermoplastic, and he has enough of it, the molder can unload it to a scrap dealer, recover up to 50% of the purchase price. Last year, according to one guess, scrap reprocessors relieved molders of 40 to 60 million lbs. of thermoplastic, excluding vinyl film. But it's just a guess—not an accurate appraisal of material reprocessed. Most reclaimers won't even guess at the figure; the explanation: nobody wants to admit use of scrap plastic.

Like the industry it depends upon, plastic reprocessing has been riding a boom. Right now, avers Alexander Chester, sales vice-president of H. Muehlstein & Co., one of the larger reclaimers, scrap has several hundred applications. Only seven years ago, however, uses numbered less than a hundred. Accounting for this upswing:

- Record use of plastics has produced greater amounts of waste.
- Molders can reduce operating costs by selling waste and unusable virgin material; and sometimes by using reprocessed plastic in lieu of new material.
- Some products made with scrap (combs, small toys) would be uncompetitively dear if made from virgin plastic.

Back to 1920: Muehlstein started out as a scrap rubber company, got into reprocessed plastics in 1920. At that time, resin output was low and reprocessing applications few. Now, however, the company finds it needs six regional warehouses, three laboratories, and 200 people to run its plastics business.

Molders and fabricators furnish most of the scrap the company reprocesses. Bulk of the material—polystyrene, polyethyene, and vinyl—is purchased in lots ranging from 1 to 20 tons. The scrap usually consists of tailings, unsalable stock, and surplus material.

Since many customers are users as well as suppliers, Muehlstein salesmen double as plastic procurers.

After purchase, the scrap is shipped to one of the company's warehouses. Here, the plastic is sorted and readied for future use. Following sorting, which classifies the scrap according to similar physical, chemical, and color characteristics, the resins are pelletized and stored pending a color "assignment." Once the laboratories determine what colors best tint the scrap, the batch is colored.

In all reprocessing operations, problems abound. Of these, believes

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A FEW BRIEF EXAMPLES

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☐ **NAPONS** are chemically treated starches with the unique combination of emulsifying and thickening properties. USES: Textile, paper-tub or calender sizing, cosmetic emulsions, ore flotation.

☐ **CATO STARCH** is a cationic starch with high affinity for cellulose fibers. It improves the strength factors of paper and still permits high machine speeds. USES: Headbox additives, ore flotation, sizing, thickening agent.

☐ **CM STARCHES** are soluble in cold water and mix readily without lumping. They have good filming properties and impart grease or water resistance. USES: Tub sizing, calender sizing, coatings, beater and headbox additives.

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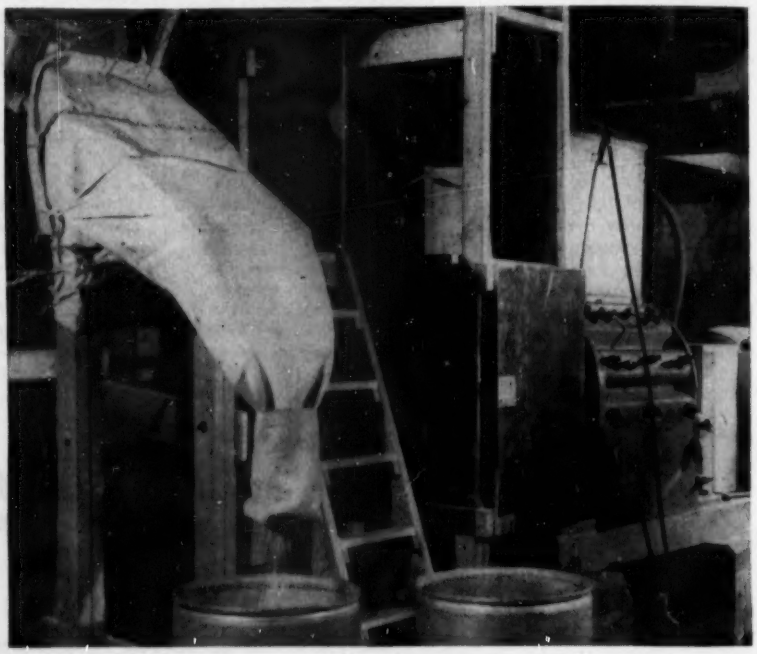
TESTS appraise tensile strength; hand-sorters look for contamination.

Chester, the most serious are:

• Contamination. Impurities, such as "foreign" plastics, metal, and dirt wreak havoc on applications. Traces of different plastics result in a laminating (material peels off) product; metal particles can break molding machinery; and dirt restricts use of color choice. To avoid contamination the material is hand-sorted by 50 specially trained checkers. Problems are referred to the laboratory.

• Color. As no two batches of scrap plastic are exactly alike, color reproduction is a critical problem. And, while a molder might obtain the color desired today, variations in the source of supply could render color



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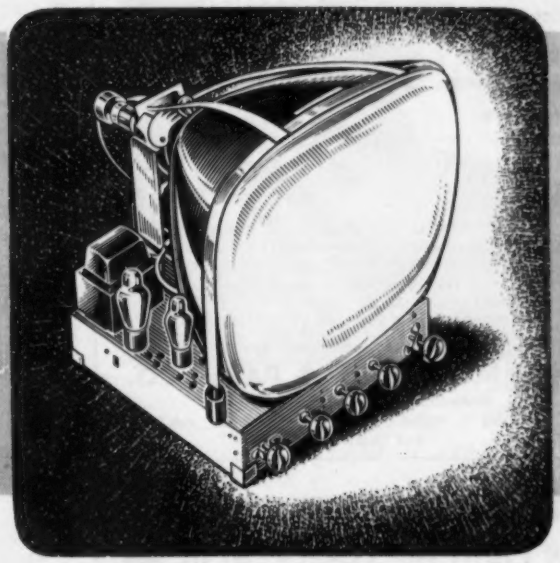

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J. T. Baker Chemical Co. has long supplied tonnage chemicals of controlled purity and physical uniformity for industries where precision is the key word.

In the electronics industry Baker has worked closely with engineers in supplying their high purity chemical needs for radar, radio and television equipment.

Now, with the increasing production of high fidelity equipment and the development and perfection of color television there are new challenges of tolerances that Baker is well equipped to handle.

Some of the Baker Chemicals popular with the electronics industry are shown on this page. As your electronics development work requires these or other chemicals to precise standards, Baker is your logical source of dependable supply.

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matching at a later date impossible. For applications such as on wall tile, where reproducibility is important, use of reprocessed material is risky. Muehlstein gets around the color dilemma as best they can by devoting a considerable part of its lab work to coloring.

• Shipping. Operating on low profit margins, reprocessors can only profit by selling volume quantities. But, since they sell a product priced in cents per pound, shipping costs are an important factor in reprocessing economics. Answer to the freight question, the firm found, was to set up regional processing centers and warehouses. Although Muehlstein strives to sell scrap in the area purchased, Chester estimates only about 50% is sold that way.

To sell and purchase its plastics, Muehlstein has a force of 25 men. Advertising in plastics industry magazines aids the salesmen, who generally line up contacts directly. Best customers: toys, novelties, buttons, and plastic pipe.

According to Chester, scrap plastics can be used for almost every noncritical application, i.e., where possible contamination and altered physical characteristics are not important. Thermoplastics lose some heat stability upon reworking, tend to become brittle. And, as Chester points out, a housewife will be highly dissatisfied if there's a speck on her $300 refrigerator that she can't wash off.

Virgin plastic manufacturers generally take a dim view of reprocessing operations, feel that scrap is a generally inferior product. One large producer doubts that any saving results from use of scrap materials. His reason: loss on increased seconds from molding would be more than the increased cost of "new" plastic.

Although everyone concedes vast expansion for plastics, opinion is sharply rent on the future of reprocessed material. On one side, manufacturers of virgin plastic expect a drop in scrap use because:

• Production of virgin plastic has now caught up, erased shortages of recent years.

• Adoption of industry plastic standards, such as those for vinyl film and plastic pipe, will curtail use of scrap.

Muehlstein, however, remains optimistic; (backing up its confidence, the firm is currently researching uses for recovered saran). It believes that there will always be a place for "second"-line quality; and that soaring production will necessitate additional scrap outlets.

ATLAS chem-memos

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Sorbitol, a hexahydric alcohol derived by Atlas from the reduction of glucose, offers specific advantages of quality and economy in the formulation of certain resins used in protective finishes.

In the preparation of oil-modified alkyds, sorbitol is generally used in combination with other polyols. It imparts faster air-drying and baking characteristics, and produces films with greater toughness. The ratio of sorbitol may be varied over a considerable range to give desired effects. Most frequently used proportions are from 40 to 50 per cent.

Rosin esters of sorbitol, prepared by reacting the rosin acid with an excess of polyol, give a broad field of usefulness. When modified with maleic anhydride, for example, they develop hard, high melting resins that find use in both lacquers and varnishes. Tests indicate that lacquers containing sorbitol resins possess an excellent balance between sanding properties and cold check resistance.

Whether used by itself or in conjunction with other polyols, sorbitol affords economies due to its low, stable price. A number of formulas for sorbitol-based resins have been worked out in the Atlas laboratories. These are listed, along with procedure for preparation and physical characteristics, in a booklet entitled "Sorbitol Resins." We'll be glad to send a copy on request.

Atlas emulsifiers improve formulas for self-polishing waxes

Floor and furniture polishes based on Carnauba, Candelilla or synthetic waxes use Atlas emulsifiers in their preparation to obtain several specific advantages. Atlas non-ionic emulsifiers provide greater stability of the emulsions against changes in temperature during storage, and variations in wax and water. In addition, emulsions are easier to prepare. The wide compatibility of Atlas emulsifiers permits the inclusion of extenders, such as paraffin wax, Congo gum, shellac dispersions and linseed or mineral oils.

To overcome gelling and other difficulties in emulsification resulting from uncontrollable variations in Carnauba wax, Tween® 20 is often used as an auxiliary emulsifier with other non-ionic emulsifiers, and also in soap-type formulations. The following formula for a dry-bright floor polish is typical of its application with another non-ionic:

Carnauba wax	10%
Atlas G-9446N polyoxyethylene sorbitan mono-oleate	3%
Tween 20 polyoxyethylene sorbitan monolaurate	2%
Water	85%

Preparation: heat wax and G-9446N to 100°C. Add two-thirds of the water slowly. Invert by adding Tween 20 slowly with agitation. Add balance of water and cool.

Other industrial applications of Atlas emulsifiers are described in "A Guide to Formulation of Industrial Emulsions with Atlas Surfactants." A copy will be sent on request.

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HATHAWAY: Data is easy to gather, difficult to act upon.

Goal Shoals Ahead

"The benefits and evils of the expansion goal program spurred by the Korean crisis will not be fully realized until all of the tax-amortized facilities come into being. The marketing problems of some of these 60 goal-chemicals will be considerable."

Coming as the considered opinion of the former director of the government agency charged with the program, these statements might well give pause to chemical producers interested in expanding those problem items.

But Davison Chemical's Norman Hathaway does not appear inclined to pull his punches in facing up to the decisions reached by the Business & Defense Services Administration and its predecessor, the National Production Authority.

Rather in a recent discussion in New York City,* Hathaway, while predicting marketing shoals ahead, implied that most expansion goals were justified under the circumstances, that future dislocations of the supply-demand balance attributable to government encouragement would be only temporary.

Early Burdens: Pinpointing several present and possible future marketing trouble-makers, Hathaway detailed these individual chemicals:

- **Toluene.** Even with recent production flowing at only 65% of the 1955 goal of 185 million gal. annual rate, marketing problems are already arising.
- **Benzene.** Here the situation is

* Before a combined audience of members of the New York Chemical Marketing & Economics Section of the American Chemical Society and the Chemical Market Research Assn.

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12-HYDROXYSTEARIN AS A CHEMICAL INTERMEDIATE

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similar to the toluene picture. Late production figures show an oversupply with only 63% of the 1955 goal of 375 million gal./year attained.

• **Styrene.** Production right now is on a 472-million lb./year basis, far short even of 1951's 626 million lbs. capacity, and miles away from the 1955 1.21-billion lb./year goal.

Despite these discrepancies between supply and demand, Hathaway was inclined to minimize future difficulties of petroleum-derived chemicals. Reason: production can usually be diverted to other products within the refinery.

In certain other products, he admitted, dislocations would not be so easily or quickly put aright. Two of these:

• **Nitrogen.** The ammonia goal in this case is 3.5 million tons, twice 1951 capacity. As Hathaway sees it, the larger portion of the increases unfortunately have been postulated upon "total mobilization" for agricultural purposes as well as for military and industrial requirements. As a result, we may expect marketing problems to be especially acute unless a prolonged all-out war effort becomes an actuality.

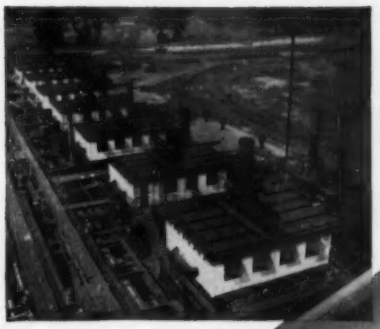
• **Chlorine.** Localized distribution disturbances may well result from conflicting industrial growth and military demands. Example mentioned by Hathaway: the plant constructed at Muscle Shoals, Ala.

Although the plant has never operated at capacity and has recently been shut down, the Army insists that it be kept running to make chlorine available in the immediate area. Resulting outlook for nearby producers in Alabama, Tennessee, Arkansas and Virginia, in Hathaway's words: "I am hopeful their sales problems will not multiply as a result of the entry of this new production."

Having the Cake: Basic cause for justifying such probable dislocations is, of course, the government's political decision to fight a butter-and-guns battle. And influencing the numerous individual decisions by BDSA are the tugs and pulls of such weighty bodies as the U.S. Depts. of Defense and Agriculture.

"For," as Hathaway reminded his hearers, "market research in the BDSA is quite different from that done by chemical companies or trade organizations." Although in respect to obtaining data, the government enjoys mandatory rights not available to industrial marketers, decisions resulting from consideration of the data are almost never the judgment of a single agency.

Not So Bleak: But despite the



Ammonia, formerly produced from coke, is now made from natural gas by the Nitrogen Division, Allied Chemical & Dye Corporation at its Hopewell, Virginia and South Point, Ohio plants. A third plant is now nearing completion at Omaha, Nebraska. Girdler designed and built the natural gas reforming plants at all of these locations. Girdler catalysts are used in these gas plants.

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handicaps to industry resulting from government-encouraged expansion, "the picture," Hathaway consoled his hearers, "is not quite so bleak as it sounds."

Two redeeming factors advanced by Hathaway to relieve hard overproduction realities stemming from the mobilization for national survival:

- The high growth rate of the chemical industry will probably catch up to excess capacity in two to five years.
- Imaginative selling and thorough market research—chemical industry characteristics—will no doubt create new outlets.

•

For your reference file: Nitroparaffin data sheets, Bulletin 23, from Commercial Solvents Corp., New York, tabulates uses, reactions, specifications, and physical properties for four nitro alkanes.

- Magnesium car-loading ramps are described in new literature available from the Penco Engineering Co., San Francisco.
- Prefabricated display exhibits manufactured from "Rigicor," a corrugated cardboard, are detailed in a new portfolio by Capex Co., Evanston, Ill.
- "Monsanto Plasticizers," a 63-page booklet, records physical properties, specifications and uses for five different types of plasticizers.
- Delayed - action accelerators, American Cyanamid Co.'s (Bound Brook, N.J.) bulletin, contains technical data for two rubber accelerators.
- Fine organic research chemicals, price list of rare organics, has been issued by Organic Research Chemicals, Colnbrook, Eng.
- U.S. Government Purchasing Directory contains lists of over 4,000 commodity classes from which the government buys some 5 million items; plus agencies that buy them.
- "Marketing Research Procedures" is a 7-page bibliography of market research literature on methods and techniques; Small Business Administration, Washington 25, D.C., free.
- "Design is Your Business," (Small Business Management Series No. 10) a 45-page booklet, explains significance of design in manufacture, packaging and selling. Govt. Printing Office, Washington 25, D.C., 25¢.
- "Sales Training for the Smaller Manufacturer" (Small Business Management Series No. 11) suggests practical salesman-training methods for small entrepreneurs, and discusses means of competing with larger companies. Govt. Printing Office, Washington 25, D.C., 20¢.
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Small Business Education" provides material on setting, location, finance, marketing, expansion and other problems from a small business viewpoint. Cat. No. C 18.271:27, Supt. of Documents, Washington 25, D.C., 30¢.

• "Fluorothene Resins" is a technical data brochure on properties and application techniques of fluorothene resins. Bakelite Co., division of Union Carbide and Carbon Corp., New York.

• Pharmaceutical equipment catalog describes pharmaceutical machinery and laboratory glassware. "PerFeKtum" Catalog No. 454, Popper & Sons, Inc., New York City.

• Industrial "Micarta" plastic, 50-page literature, is available from Westinghouse Electric Co., Pittsburgh.

• National Aniline Div., Allied Chemical & Dye Corp., New York City, offers a technical bulletin on 1,4-naphthaquinone.

• A guide (booklet) to coatings and facings for superfine fiber glass insulation sketches the properties, uses and methods of application. Libbey-Owens-Ford Glass Co., Toledo, O.

•

Books: "Detergency Evaluation and Testing" describes screening tests, cotton washing, wash test methods, wool washing, washing methods for other fibers, hand surface cleaning, and radio-isotopic tracer methods. By J. C. Harris, director of application research, Monsanto's Merchandising Div. Interscience Publishers.

• "Artificial Fibers" treats the technical aspects of synthetic fibers. Revised second edition includes the new fibers. By Robert W. Moncrieff, 455 pp., $6. John Wiley & Sons.

•

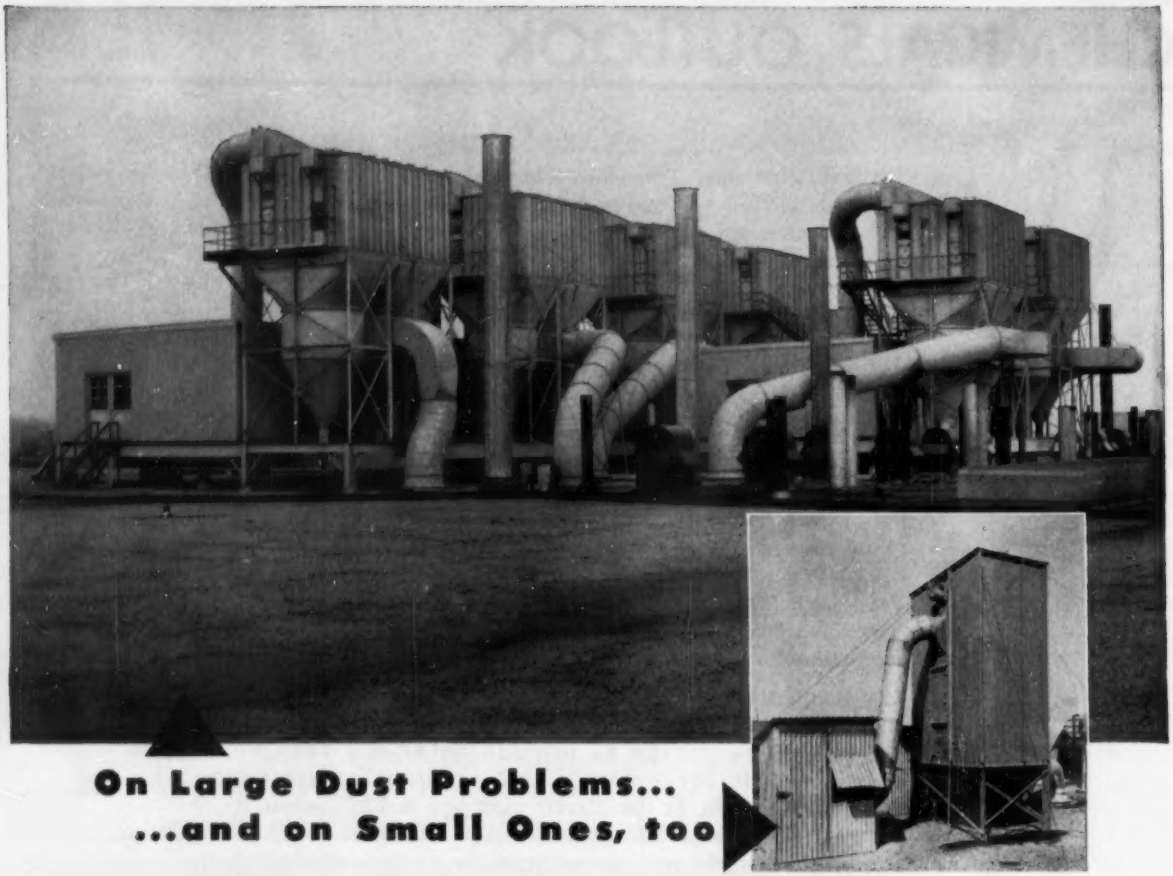
Expansions: International Paper Co. has established a new converting factory to manufacture multiwall sacks at Mobile, Ala.

• General Electric Co. has enlarged its Taunton, Mass., plastics operation with the addition of 5,000 sq. ft. of office space and toolmaking area. GE says this is the first step in a general expansion of its plastics department. Goal: improved customer technical service.

•

Bulk Plasticizers: Union Carbide and Carbon Corp. is now producing its Flexol plasticizer 77-G in tank-car quantities.

• Monsanto's Organic Chemicals Div. is currently offering its colorless primary plasticizer, Santicizer 160, for polyvinyl chloride and vinyl copolymers at the tank-car price of 25¢/lb. The bulk price results, aver Monsanto officials, from increased use in vinyl chloride formulations.



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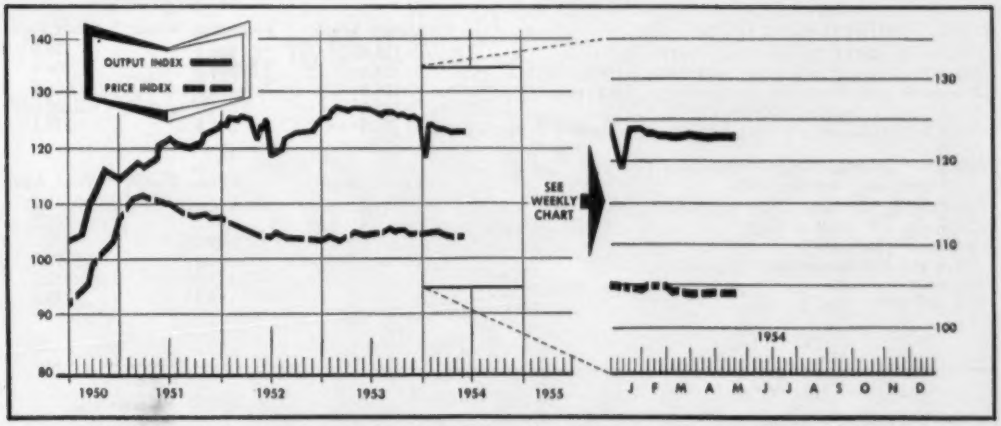


CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

Sudden—but not entirely unexpected—price cuts have some sections of the chemical marketplace in a state of flux this week. Prime example of a stirred-up situation is that affecting methanol.

The indication here a couple of weeks ago (CW Market Letter, May 29) that price-shading practices were landing some telling blows on the methanol market was emphatically underlined by Du Pont's deep 10% slash of official schedules.

The action, designed to knock the props from under the spreading "special deals," is heartily endorsed by some marketers, being emulated by most. New tank tags will be generally 5¢/ gal. lower—27¢ in Eastern areas; a nickel more than that in the West.

A few bulk pricing problems popping up, however, may call for some interpretation of schedules before the situation smooths out. Large barge users, for instance, look askance at the slim differential between the 25¢/gal. (shipped anywhere in the U.S.) they are currently paying, and the mere half-cent-higher (f.o.b. terminal point) price to buyers of considerably smaller lots.

Likely resolution of that particular bobble: elimination of the latter schedule, application of the tank-car price to all but barge shipments.

•

The synthetic methanol decline, of course, is pegged as the chief depressant of formaldehyde price. The latter producers are often prompt in passing on savings to customers. At the moment users are paying from two-tenths to a half cent/lb. less, depending on grade and quantity.

Demand from major outlets has been fairly steady, but not a few sellers are frank to admit that a desire for increased business was also a consideration behind the cut.

•

The same chain-reaction price nudge is responsible for currently 2¢/lb.-lower pentaerythritol. Hercules Powder, attributing the reduction to reduced formaldehyde costs (and partly to upped production), late last

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	123.4	123.4	126.4
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.3	104.2	104.4
Bituminous Coal Production (daily average, 1,000 tons)	1,196.0	1,192.0	1,606.0
Steel Ingot Production (1,000 tons)	1,740.0 (est.)	1,674.0 (act.)	2,208.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	308.7	307.8	244.1

MONTHLY INDICATORS—Wholesale Prices (Index 1947-1949=100)	Latest Month	Preceding Month	Year Ago
All Commodities (Other than Farm and Foods)	114.5	114.5	113.6
Chemicals and Allied Products	107.1	107.2	105.5
Industrial Chemicals	117.3	117.4	118.0
Drugs and Pharmaceuticals	94.0	94.0	93.1
Fertilizer Materials	114.0	114.1	112.9
Oils and Fats	60.0	59.8	49.9

week led the parade with cuts to 32¢/lb. (c.l.), 33¢/lb. (l.c.l.).

The prices quoted are for delivery in the East and Midwest, f.o.b. Mansfield (Mass.); corresponding cuts are also in effect on the West Coast. (Di- and tri-pentaerythritol, too, are down a similar 2¢/lb., to 35¢ (l.c.l.).)

Most PE producers, who were reluctant to go along with the competitive-product glycerine reductions a few months ago, are following Hercules' lead now, even though synthetic resin demand for technical PE is sustained.

•

Increasing demand for caustic soda, combined with the production hold-down due to chlorine satiety, have makers posting higher domestic prices for solid and flake forms.

Dow and Solvay are both upping tags by $3/ton, establishing—immediately on all spot tonnage, July 1 on contract orders—these new c.l. schedules: solid caustic, $3.85/cwt.; flake, $4.25/cwt.

There's still some question of what effect the domestic action will have on export prices in light of the reportedly brisk inquiries but laggard buying, by overseas customers (CW Market Letter, June 5).

•

Current pickup in lead and zinc buying seems to underscore persistent trade talk that the government will move into the market for some modest stockpile purchases in the not-too-far future.

At any rate, prices of both these nonferrous metals have been pressured upward—¼¢/lb. on lead; ½¢ on prime zinc—the former to 14¼¢ (N.Y.); the latter, to a firm 11½¢/lb. delivered in N.Y.

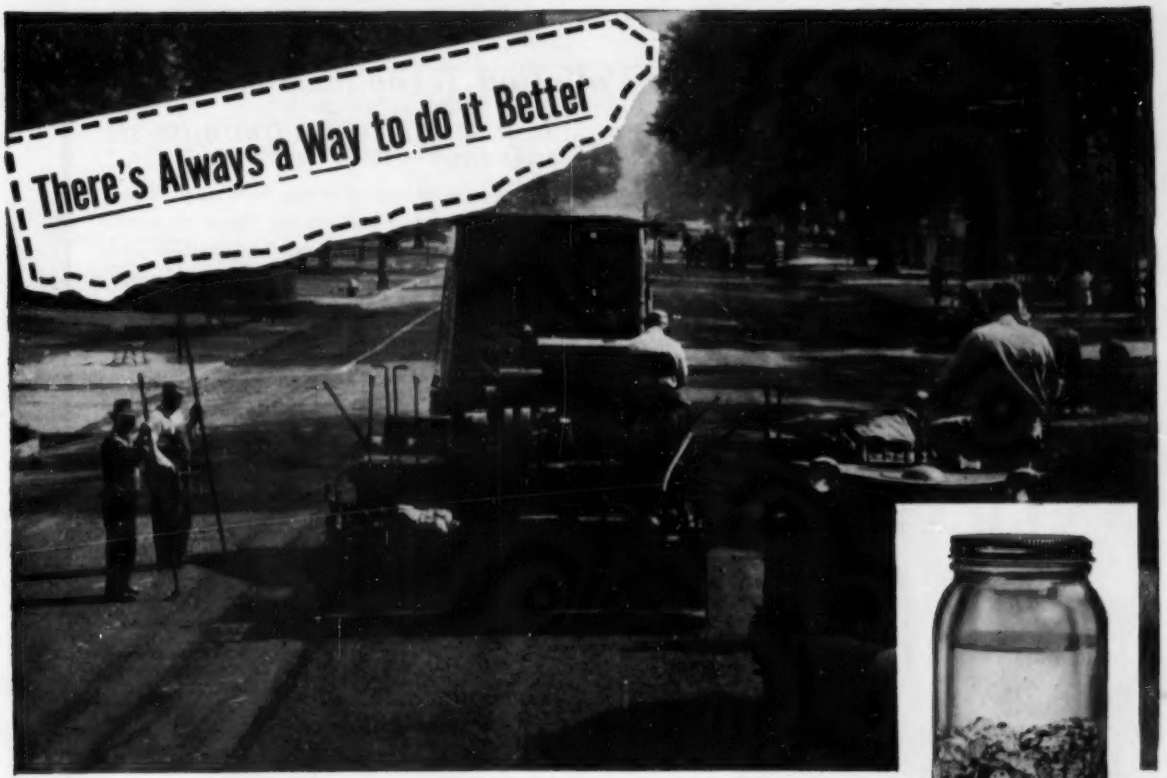
Reasonably good demand from paint makers—plus, of course, the more expensive lead—is, understandably enough, boosting lead oxides to slightly higher levels. Dry red lead, litharge and orange mineral are all up ¼¢/lb. to 16¾¢, 15¾¢ and 19.35¢/lb., respectively.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending June 7, 1954

DOWN

	Change	New Price		Change	New Price
Ammonium sulfate, bulk, ton			Methanol, synth., tanks, E. gal.	$ .05	$ .27
Coke oven	$2.00	$42.00	Paraformaldehyde (91pcs), flake, bgs., c. l., frt. alld.	.0125	.1075
Synth.	3.00	42.00	Pentaerythritol, tech., bgs., c.l., works	.02	.32
Formaldehyde, NF, inhibited, tank cars, Zone 1	.0045	.0375			

All prices per pound unless quantity is stated.



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The infrared spectrum shown would result from a concentration of 1.5 ppm CCl_4 and 5 ppm ortho-xylene in room air compressed to 10 atmospheres in a 10-meter path length absorption cell. All components in sample appear simultaneously and their concentrations can be determined from the strength of their absorption bands.

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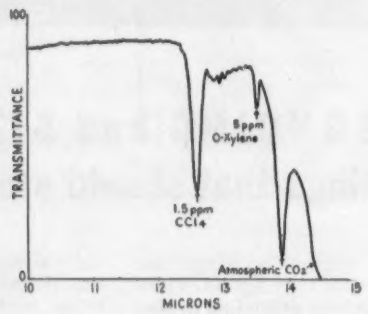

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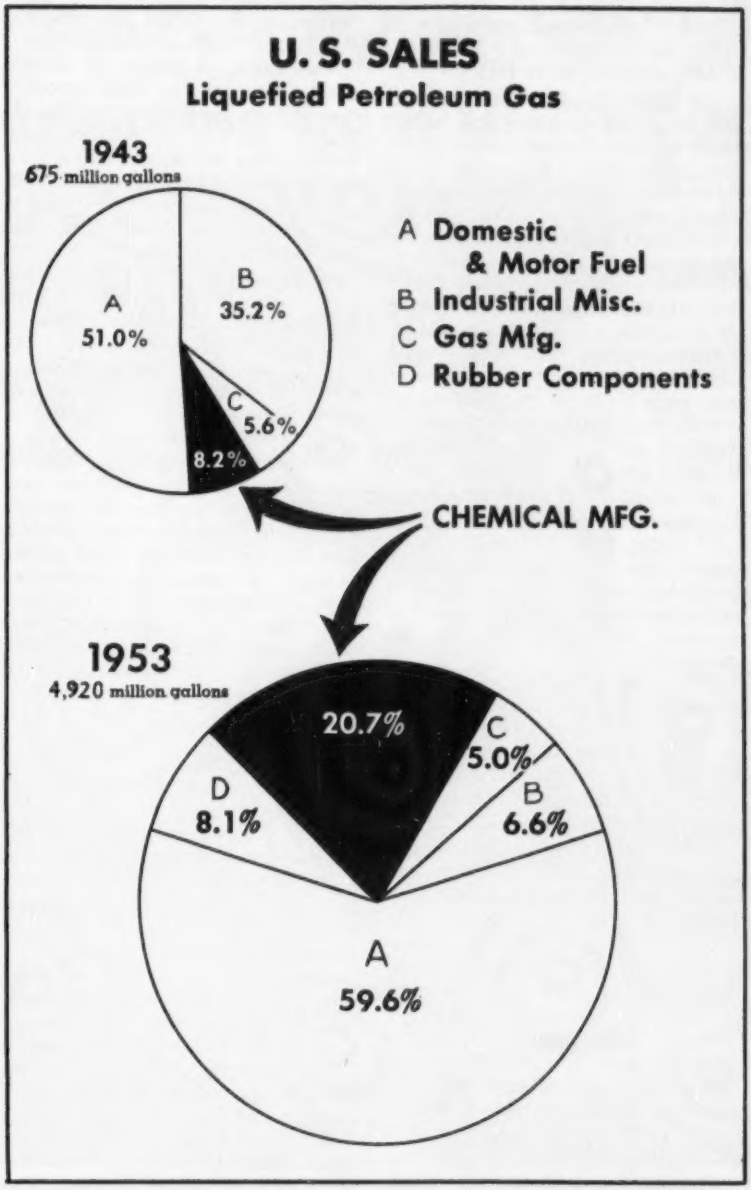

FOR CHEMICALS: In ten years, a bigger bite of a bigger LPG pie.

Volatile Phase for LPG

Drawing a heavy line of emphasis under the startling expansion of the chemical process industries — as did the recent observance of Chemical Progress Week (CW, May 15)—is the steep upcurve in production and use of one increasingly important chemical raw material—liquefied petroleum gas (LPG).

Experts estimate that petroleum and natural gas sources currently are about 25% of the total quantity of chemicals produced in this country, the major portion coming from LPG-labeled hydrocarbons.

LPG's deep slice into the chemical raw material market is graphically illustrated by the changes wrought in the brief span of a decade (*see chart*).

Few doubt that in 1954 the manufacture of chemicals and chemical intermediates (including rubber com-

ponents) will consume less than 30% of the slightly more than 5 billion gal. of LPG expected to be sold.

Gas Dispersion: But while chemical use last year registered the largest single category increase—about 16.6% over 1952—other LPG outlets fared somewhat differently. Industrial and miscellaneous, and gas manufacturing (utility use) suffered declines; gaining, but not as greatly as chemicals, were synthetic rubber compounds and domestic and motor fuel use. The latter consumed nearly 3 billion gal. in 1953, according to Phillips Petroleum's George Benz and Paul Tucker who early this year whipped up an eagerly read LPG industry report.

Here's a thumbnail run-down on the other principal LPG users:

• Industrial and miscellaneous application is estimated to have dropped 2.9% during 1953. The decline in industrial use by itself, however, was probably nearer 5 or 6%. A step-up in miscellaneous use of LPG tended to minimize the over-all drop in this category.

(One such "extra" outlet may soon begin bucking chemicals for a share of the weed-killer market: some railroads are toying with the idea of LPG flame-weeding in maintenance of rights-of-way, indicate that burniing is cheaper than chemical treating.)

• Sales of LPG for gas manufacturing are estimated to be 247 million gal. —a decrease of 5% compared with 1952.

• LPG for production of synthetic rubber components during 1953 increased an estimated 7.5% over the previous year's near-371 million gal. With the recent cutbacks in the government-owned synthetic rubber operations, it seems unlikely that 1954 consumption of the crude oil, natural gas by-product will top 400 million gal.

Chemical Cornerstone: As a chemical building block, however, LPG is slated to become more and more important. At the Liquefied Petroleum Gas Assn.'s national meeting in Chicago last month, Monsanto's Henry Groppe underscored this trend.

Groppe delved into the present sources and quantities of specific LPG hydrocarbon raw materials used by the chemical industry and the products produced from them, and the probable future output of these chemicals and resulting increased needs for LPG; and indicated where the chemical industry will probably look for these increased requirements.

Because of their close tie-in with liquefied petroleum gas commodities (e.g., propane, propylene, butane, butylenes), the LPGA spotlight was also turned on ethane and ethylene.

The latter, of course, is already rated as one of the most important chemical raw materials (*CW, Feb. 20, p. 87*). Last year, for instance, some 2,200 million lbs. flowed into a flood of chemical outlets. Some 10% of it came directly from refinery gas, 40% was produced by pyrolysis (thermal decomposition) of ethane recovered from natural and refinery gas, and 1,150 million lbs. by propane pyrolysis.

Ethylene's consumption future, of course, is pretty well charted—the curve is definitely upward. Within a couple of years, chemical use may well jump another 1 billion lbs./year, a good 45% over last year.

At the moment, synthetic ethyl alcohol ranks as the No. 1 ethylene consumer. Some 29% of the 2,200-million-lbs. output helped to edge fermentation material out of the ethyl alcohol market. (And trodding the chemical path a little further reveals that more than half the acetaldehyde made in the U.S. stems from ethyl alcohol, with the synthetic ethanol stream alone accounting for about 350 million lbs./year.)

Groppe estimates that about 27% of ethylene production is utilized in turning out ethylene oxide. Although the oxide itself has few direct applications, a list of its derivatives and subderivatives is impressive, growing.

About 80% pours into the manufacture of ethylene glycol (antifreeze), ethanolamines, acrylonitrile; 20% into detergents, synthetic fibers, etc.

Styrene dips about 11% out of the ethylene pot. Main uses, of course, are, and have been, the production of GR-S rubber and polystyrene plastics. Lesser amounts ripple into growing markets such as latex paints, polyester resins, isobutylene, among others.

The fourth major ethylene siphoner, ethyl chloride, currently consumes about 225-230 million lbs./year. This and the other three main outlets take almost 85% of the available ethylene.

Polyethylene, though, is expected to provide ethylene's biggest growth factor—and not long hence. Capacity estimates for, say 1956, range from about 500 million lbs./year and up depending upon which crystal ball you trust.

Add other ethylene offshoots (ethylene dichloride, ethylene dibromide, vinyl chloride, etc.) and it becomes clear why the ethylene field offers the lushest market for chemical raw materials from the LPG industry.

Ethylene Output Poser: There's a question, though, of which of the three principal potential sources—re-

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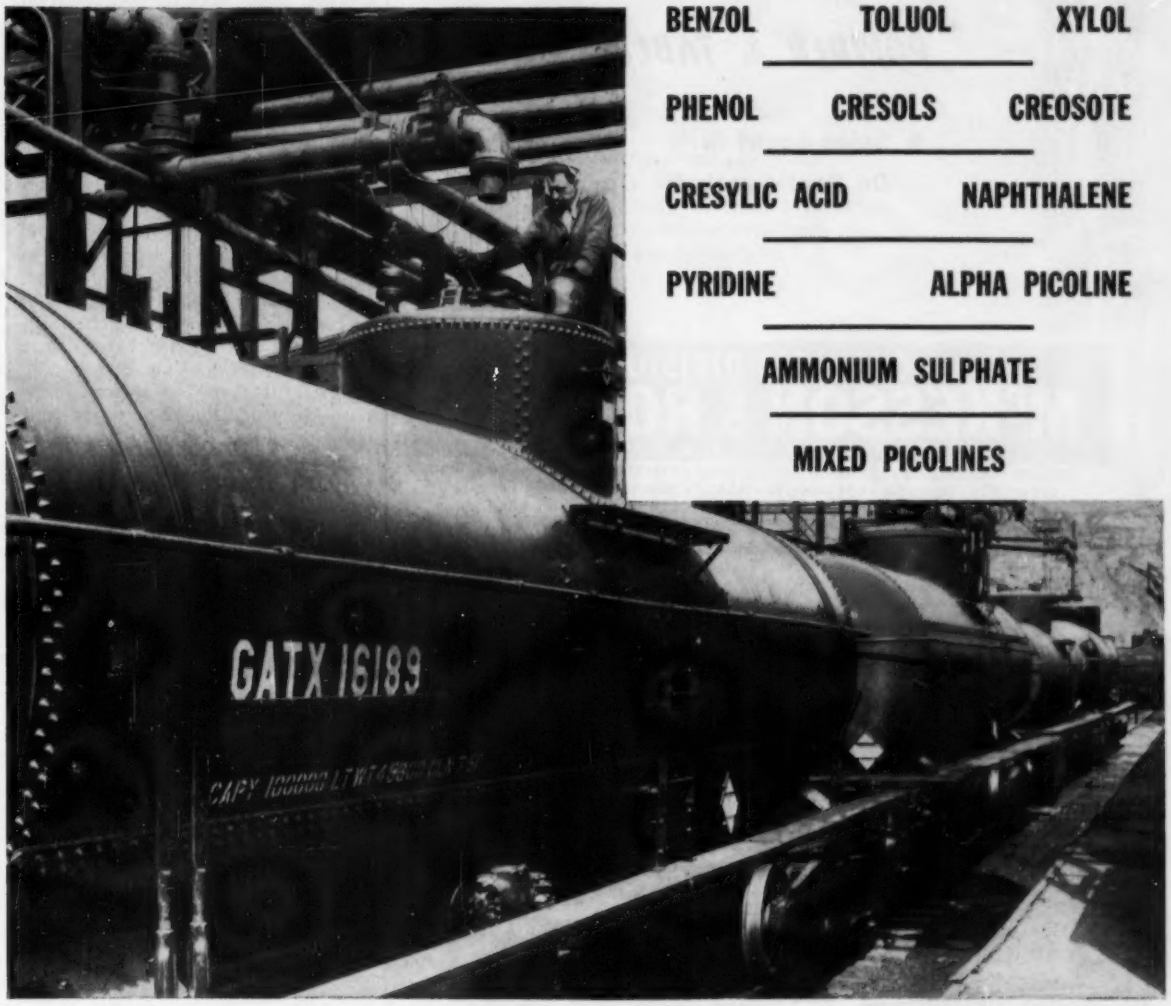

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finery gases, ethane, propane—will contribute most to the increase in ethylene requirements.

Refinery gases represents a relatively cheap basic source of ethylene. Reason: the contained ethane is available for a separation cost plus equivalent fuel value. Since the concentration of ethylene in these streams is comparatively small, however, recovery can be justified only in large-scale operations.

Pyrolysis of ethane as an ethylene source has scarcely been tapped. Last year only about 850 million lbs. (or approximately 7%) was utilized of an estimated 12,000 million lbs. ethylene equivalent of recoverable ethane potentially available, primarily in natural gas.

The relative value of ethane, of course, depends almost entirely on its alternate use as a gaseous fuel. Thus, the long-term price—assuring a rapid growth of this ethylene source—should be fairly stable, increasing gradually, perhaps, as fuel gas prices go up.

Low price, too, will be the switch-thrower on any future increase of ethylene-from-propane. The present propane price (about 3½¢/gal., f.o.b. producing plants in the Southwest) makes it definitely competitive with other ethylene source material in large-scale ethylene manufacturing operations in that area. But any appreciable hike in propane tags could cause a customer shift.

Total chemical consumption of propane, including production of ethylene, propylene and direct oxidation products, last year hit approximately 830 million gal., or about 17% of total LPG sales. And while ethylene (with by-product propylene production) took the bulk of it, about 200 million lbs. of propane filtered directly into methanol, formaldehyde, acetaldehyde, acetone and acetic acid.

Isopropyl alcohol, on the other hand, in 1953 gave the propylene end use table a top-heavy look. Note this propylene chemical utilization split: isopropyl alcohol, 70%; detergents, 15%; others, 15%.

In a roundabout way, output of detergents is fast becoming a major propylene market. The route: propylene polymer, dodecene, is used to alkylate benzene to form dodecylbenzene, which, in its sulfonated form, is one of the principal synthetic detergents.

The propylene "others" category covers a more diversified field. One important use is in chlorination to allyl chloride—a starting material in the synthesis of glycerine, epichlorohydrin resins, insecticides and many other products. Acrolein, propylene oxide and glycol, butyraldehyde (via

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the Oxo process), too, are propylene consumers.

The continually growing demand for propylene in chemicals will probably hit a 1,600 million lbs./year level by 1955, some 33% more than was consumed last year. Most of the additional propylene requirements, however, will be supplied directly from refinery operations, thus will have little or no direct effect on the propane market. A small portion of the increased demand will be alleviated by propylene produced as a by-product from stepped-up output of ethylene from propane.

Butane - Butylenes Bump: Slated, too, for a healthy nudge upward is chemical industry demand for butylenes. The 1,750 million lbs. consumed last year in such outlets as butadiene, isobutylene, secondary butyl alcohol, polybutene, etc., may jump 26%, hit a 2,200 million lbs./year rate by the end of 1955.

About 68% of the estimated 195 million gal. of butane sold for chemicals in 1953 wound up in butylenes. The remaining 32% was directly oxidized to aldehydes, alcohols and acids.

If all of the expected increased butylene requirements were supplied by dehydrogenation of normal butane, the latter's consumption would skyrocket 67% over last year, reach some 325 million gal. in 1955.

That isn't likely to happen, however. For some butylene will be obtained direct from refineries. How much of the increased demand will be sated from each source will depend, in a great measure, on the future disposition of the government's synthetic rubber facilities and the relative costs of the two materials.

One competitive and valuable outlet—production of alkylate—will more than likely brake the chemical industry's supply of butylene from refineries. The high octane gasoline blending component is a prime butylene price-setting consideration.

LPG Outlook: There's no question, though, that the over-all LPG supply/demand picture is rosy-tinted. With a 1953-vs-'52 total sales increase of nearly 450 million gal., the production segment of the industry kept pace, adding 15 plants. Thus last year's estimated production capacity was boosted 550 million gal.

By the end of next year at least 12 new plants—including two in Canada—will up the industry's LPG capacity an additional 220 million gal.

And that, opine some market observers, will call for greater emphasis on selling established outlets, hunting up new customers, getting ready for a rib-bruising scramble for markets.

CHEMICAL WEEK • ADVERTISER'S INDEX

JUNE 12, 1954

tracers SECTION
(Classified Advertising)
H. E. Hilty, Mgr.

ADVERTISING STAFF

MARKETS . . . . . .

Farm Mercurials

Not a few sections of the chemical industry are following closely the current price hikes of mercurials: they're tied, of course, to the upward pace set by quicksilver.

Since the first of May, for instance, mercury has jumped more than $35/flask (76 lbs.), shoved derivative prices to higher levels.

And the outlook for one mercury-sired family—organic mercurials—may be drastically altered by these higher prices. More specifically, some agricultural outlets could be affected.

Farm use of organic mercurials has grown, and concomitantly demanded greater amounts of the basic ingredient. Some of the big takers: fungicidal seed treatments, soil disinfectants and —more recently—fruit fungicides.

Market Battle: Although a World War II-induced mercury shortage brought nonmercurial organics into prominence, they have not been able to match the mercurials as seed treatment chemicals (*CW, April 10, p. 60*).

That the latter have continued to find favor with farm customers is further underscored by some recent government statistics.

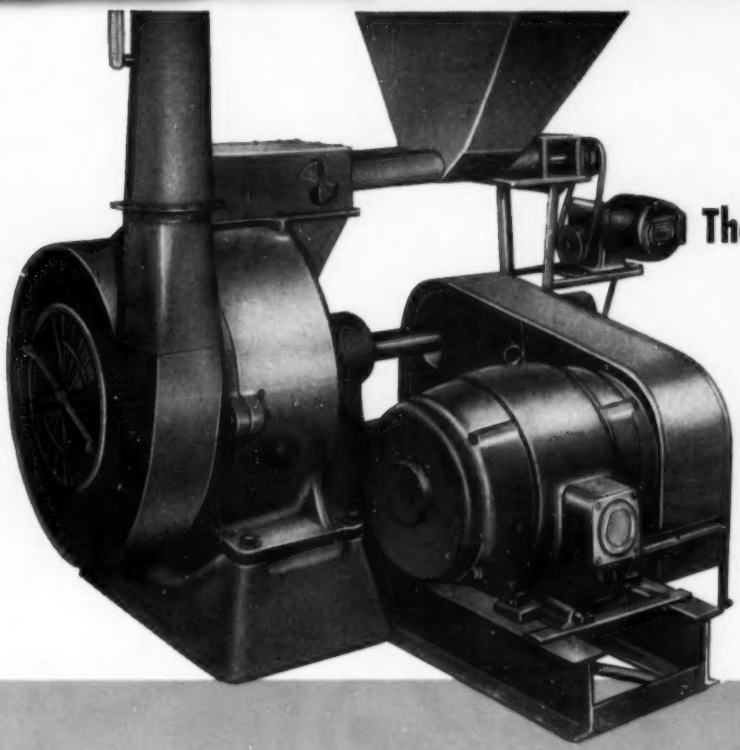
In its latest report on "The Pesticide Situation" (1953-54), the U.S. Dept. of Agriculture notes that mercury-containing compounds for use as fungicides, seed protectants, and weed killers consumed about 26% more mercury in the three-year period 1951-53 than in the period 1948-51.

Mercury Consumption
(thousands of lbs.)

	All Uses	*Agriculture*
1948	3,515	536
1949	3,029	355
1950	3,740	342
1951	4,320	588
1952	3,234	447
1953	3,982	527

H. H. Shepard, of the Commodity Stabilization Service, USDA estimates this year's agricultural requirement at somewhere between 500,000-600,000 lbs. of mercury. Shepard cautions that figures are not available on the mercury compounds coming from sources other than metallic mercury; his estimates are therefore conservative.

Users of seed treatment and soil disinfectant compounds are divided into two main camps: those who use organic mercurials and those who use the nonmercurial organics. The mercurials, until now, have maintained an edge in popularity, but the currently zooming prices may well switch a few votes to the nonmercurial organics.



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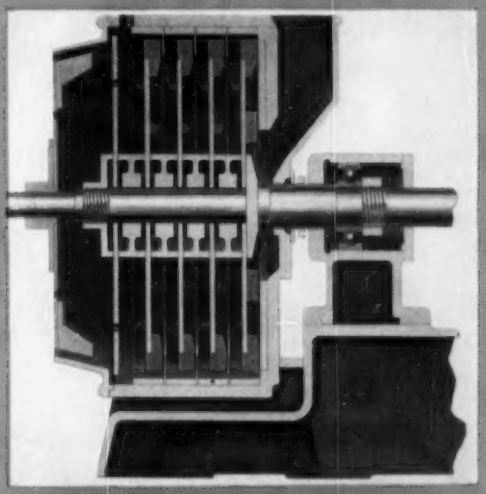
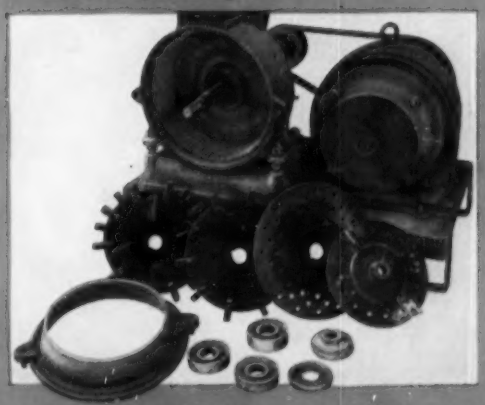


Cross section of the grinding chamber of our "Superfine" Pulverizer showing from left to right the cone plate, perforated mill plate and 4 beater plates with multi-section liner divided by annular rings.



Here is a disassembled mill. Every part separated and accessible—corrugated liners exposed for easy cleaning, exchange or replacement.

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